High prevalence of epilepsy in onchocerciasis endemic regions in the Democratic Republic of the Congo

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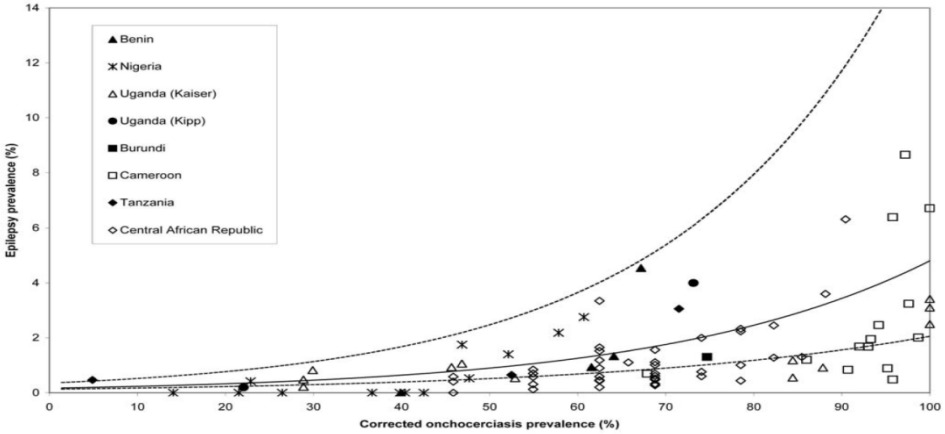
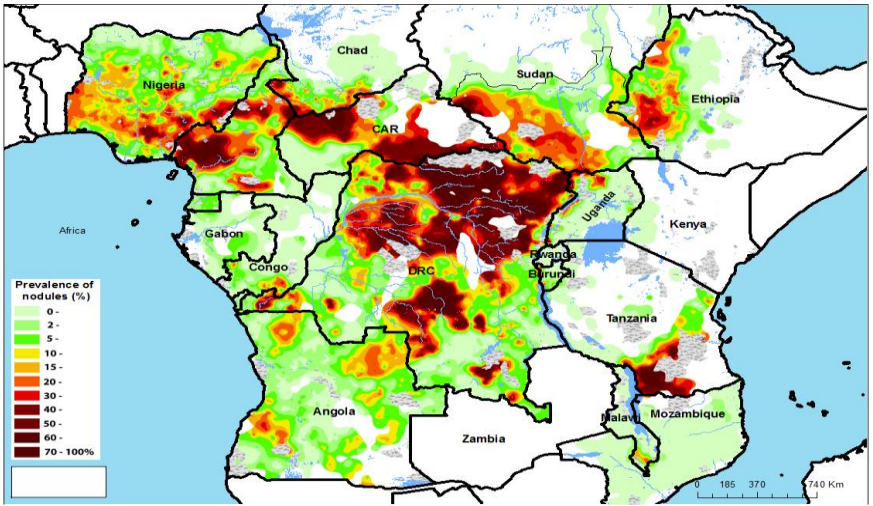
Increase of epilepsy prevalence with increased onchocerciasis prevalence



Rapid epidemiological mapping of onchocerciasis (REMO map, 2008)

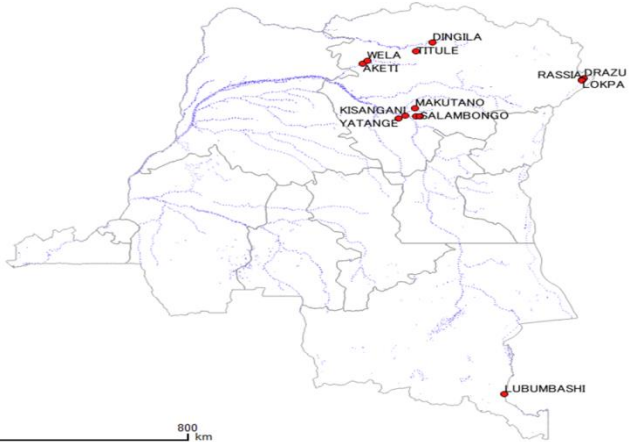


Methods

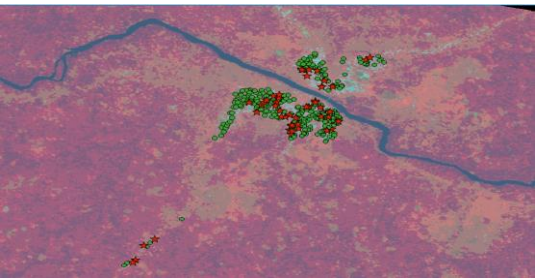
- Study period: 2014-16
- Studies in Bas-Uélé, Tshopo and Ituri province
- Epilepsy prevalence surveys in 33 villages
- 3 case control studies

Study sites


Zongo
Gemena
Bondo
Bumba
Titule
Aba
Isiro
Mungbere
Lisala
Aketi
Buta
Bunia
EQUATEUR
ORIENTALE
Kisangani
Mbandaka
Boende
Beni
UGAND
Ubundu
NORD-KIVU
Ikela
Lubutu
Goma
RWANDA
Kalima
Bukavu
BANDUNDU
BURUND
Bandundu
Kindu
Uvira
KASAI-ORINTAL
SUD-KIVU
KASAI-OCCIDENTAL
MANIEMA
Kikwit
Kananga
Mbuji-Mayi
Kalemie
TANZANI
Kabalo
Tshikapa
KATANGA


DINGILA
WELA
ITULE
AKETI
RASSIA
DRAZU
LOKPA
MAKUTANO
KISANGANI
SALAMBONGO
YATANGE
UBUMBASHI
0
800
km

Epilepsy studies in Titule

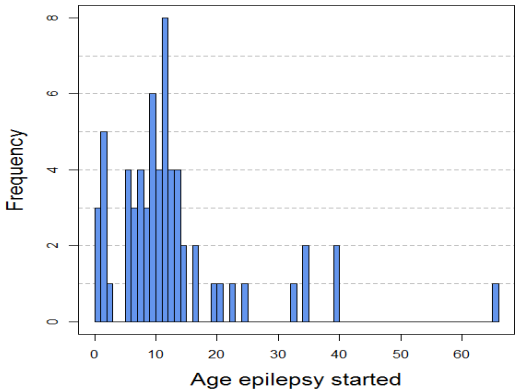


- 67/2,908 people (2.3%) with epilepsy
- Mainly convulsive epilepsy
- Living close to the river was a risk factor

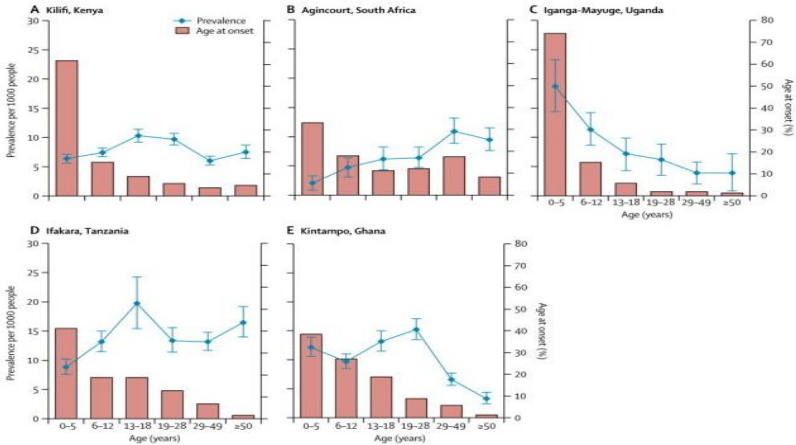
Epilepsy prevalence in non-onchocerciasis endemic demographic surveillance sites in South Africa, Kenya, Uganda: 0.23% (Kariuki et al)

R Colebunders et al 2016 Plos Negl Dis

Titule: age at the onset of the epilepsy



Prevalence of convulsive epilepsy and age at onset in non-onchocerciasis areas in Africa



Ngugi AK et al Lancet Neur 2013

TITULE : case control study

Characteristics	Cases	Controls	OR (95% CI)	P-value
Mean body weight, Kg (SD)	38.9 (11.2) (n=58)	46.7 (15.2) (n=23)	0.96 (0.91 – 1.00)	0.06
Mean height, *cm* (SD)	148 (15) (n=58)	154 (18) (n=22)	0.98 (0.94 – 1.02)	0.4
Onchocerciasis skin lesions	12/41 (29%)	1/56 (4%)	10.32 (2.04 – 52.26)	0.005
Itching	26/40 (65%)	8/51 (16%)	11.22 (3.83 – 32.82)	<0.001
Skin nodules	3/40 (8%)	2/46 (4%)	1.13 (0.14 – 9.29)	0.9
Burn scars	10/57 (18%)	0/61 (0%)	[d]	0.001

Colebunders R et al 2016 Int J Infect Dis

TITULE: case control study

Characteristics	Cases	Controls	P-value
Skin snip OV PCR pos	26/34 (76%)	10/14 (71%)	0.7
OV16 pos	39/49 (78%)	15/18 (83%)	0.5
Mansonella perstans PCR pos blood	39/49 (78%)	13/20 (65%)	0.91
Loa Loa	1	1	0.91
Taenia solium AB	neg	neg	
Toxocara AB	neg	neg	
Trypanosoma sp AB	neg	neg	
Ivermectin use last round	29/59 (49%)	29/61 (48%)	0.8

Colebunders et al 2016 Int j Infect Dis

Ituri: case control study

	Persons with epilepsy		Controls	
	Drazu	Rassia	Drazu	Rassia
Number of years IVM	0	3	0	3
Biopsy pos (MF)	55.9%	50%	29%	12.5%
Mean MFL	33.6	21.5	3.8	2.7
OV16 pos	45.7%	45.8%	26.0%	18.7%

2016 epilepsy prevalence in door to door surveys in Ituri an onchocerciasis endemic region in the DRC

Province	Health zone	Health Area	Epilepsy prevalence (%)
Ituri	Logo	Draju	6.2%
	Rethy	Rassia	3.6%
		Lokpa	3.7%

Stunted growth (“Nakalanga syndrome”)

26 year old, 26kg, 1m27, Salambongo, DRC

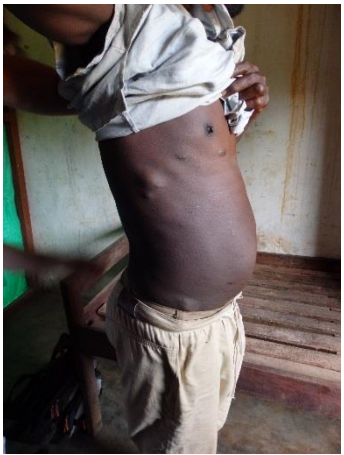
24 year old, Mvolo, South Sudan

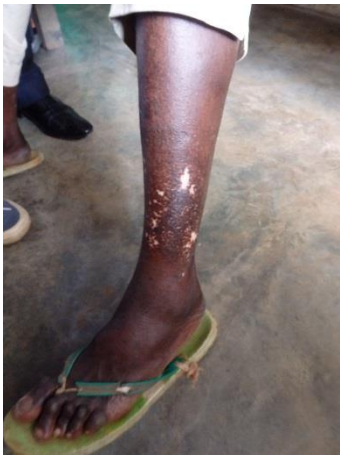
Mean age of onset of epilepsy

- OAE DRC: 11 year[1]
- Nodding syndrome (atonic form of epilepsy) Uganda: 7.6 year[2]
- Nakalanga syndrome: 2-3 year[3]

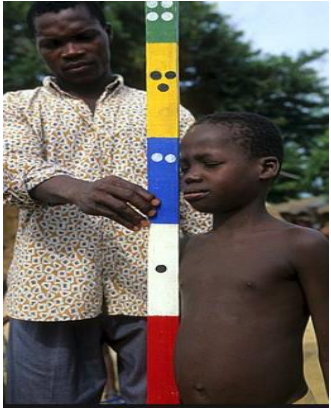
1. Colebunders R et al Plos Negl Dis 2016, 10 (5):e0004478; 2. Foltz JL et al Plos one 2013, 8(6): e66419; 3. Rapert AB East Afr Med J 1950, 27:330-59.

51 year old person, onset of epilepsy 3 years ago, migrated into the area 5 years ago, OV16 and skin test microfilarae positive, never took ivermectin





OAE can be prevented by increasing ivermectin coverage



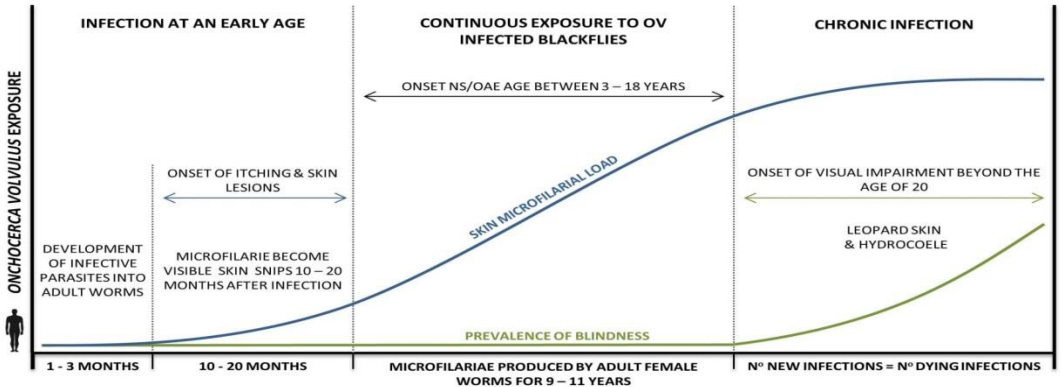
- In northern Uganda the nodding syndrome epidemic stopped after implementing onchocerciasis control
- In Cameroon/Tanzania the incidence of epilepsy also seems to have decreased since CDTi

Urgent need to prevent OAE

November 2013, Mvolo, Western Equatoria State, South Sudan

- 1 in 6 children with epilepsy
- At least 50% of families at least one child with epilepsy

It requires several years of exposure to *Onchocerca volvulus* to develop OAE



Colebunders R et al Trends Parasitol 2016

Conclusion

- High prevalence of epilepsy in onchocerciasis endemic regions in the DRC
- 3 types of clinical presentation of OAE: nodding syndrome, Nakalanga syndrome and other forms of epilepsy (mainly generalized tonic-clonic seizures)
- Increasing CDTi geographic and therapeutic coverage may decrease the incidence of OAE
- More advocacy is needed to improve treatment/care of patient with epilepsy in Africa

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