Malaria morbidity assessed by different methods in a high and seasonal malaria transmission

Alphonse Ouedraogo[1], Alfred B. Tiono[1], Amidou Diarra[1], Amathe Ouedraogo[1], Souleymane Sanou[1], Jean Baptiste Yaro[1], Espérance Ouédraogo[1], Issiaka Soulama[1], Edith Bougouma[1], Amadou T. Konaté[1], Issa Nébié[1] and Sodiomon B. Sirima[1,2]

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Affiliation :[1]Centre National de Recherche et de Formation sur le Paludisme (CNRFP)/Programme de Developpement de Vaccins Antipaludiques (PDVAP)

[2] Groupe de Recherche Action en Santé (GRAS)

Objectives

To compare two methods for the assessment of the incidence of clinical malaria episodes in two parallel cohorts (ACD & PCD cohorts) by comparing the following:

1. The age specific incidence
2. The incidence according to different parasites density threshold (>0, 5000, 10000)
3. The incidence according to malaria transmission season

Methods (1)

- Two cohort studies were conducted within the same study area of Saponé
  - The first cohort involved a group of 555 children aged 0-59 months biweekly visited home by trained study nurses. Malaria clinical episodes were recorded.
  - The second cohort included 945 children aged 0-59 months, whose parents were encouraged to report to the nearest community clinic or hospital at any time should their child feel sick.
- The treatment in both cohorts was provided free of charge

Methods (2)

- At each visit (at home or at health facilities), blood smear was obtained if fever (Temperature ≥ 37.5) or history of fever within the past 24 hours.

- Different definition of Malaria episode based on fever (and history of fever) plus different *P. falciparum* asexual parasites threshold (>0; 5,000 and 10,000 asexual parasites).

- Time at risk was adjusted with the maximum duration for a given malaria episode (standardised and set at 4 weeks).

Methods (3)

- Study duration was one year for both cohorts to take into account the seasonal variation of malaria transmission
  - High malaria transmission season :
    - From June to October,
    - EIR=44.4 infective bites/person/month
  - Low malaria transmission season :
    - Month of November to May,
    - EIR=0.3 infective bites/person/month

- Analyses : exclusion of children who have less than 50 visits in ACD cohort

Results (1)

Table 2 : Cumulative incidence of malaria episode (fever +during 12 months according to the age stratum

Age group (month)	ACD			PCD			P_value
	N° of episodes	Child-weeks at risk	Incidence rate per 1000 CWAR (95% CI)	N° of episodes	Child-weeks at risk	Incidence rate per 1000 CWAR (95% CI)	
0-11	286	3900	73.3 (21.5-125.2)	390	10712	36.4 (12.5-60.3)	< 0.001
12-23	253	3928	64.4 (15.0-113.8)	346	8496	40.7 (12.6-68.8)	< 0.001
24-35	318	5020	63.3 (19.9-106.7)	303	9292	32.6 (8.1-57.1)	< 0.001
36-47	231	5004	46.2 (7.6-84.7)	185	8464	**21.9** (0.3-43.4)	< 0.001
48-59	128	4532	28.2 (-4.7-61.2)	153	6668	**22.9** (-1.9-47.7)	0.09
Total	1216	22384	54.3 (34.9-73.7)	1377	43632	**31.6** (20.4-42.7)	< 0.001

Results (2)

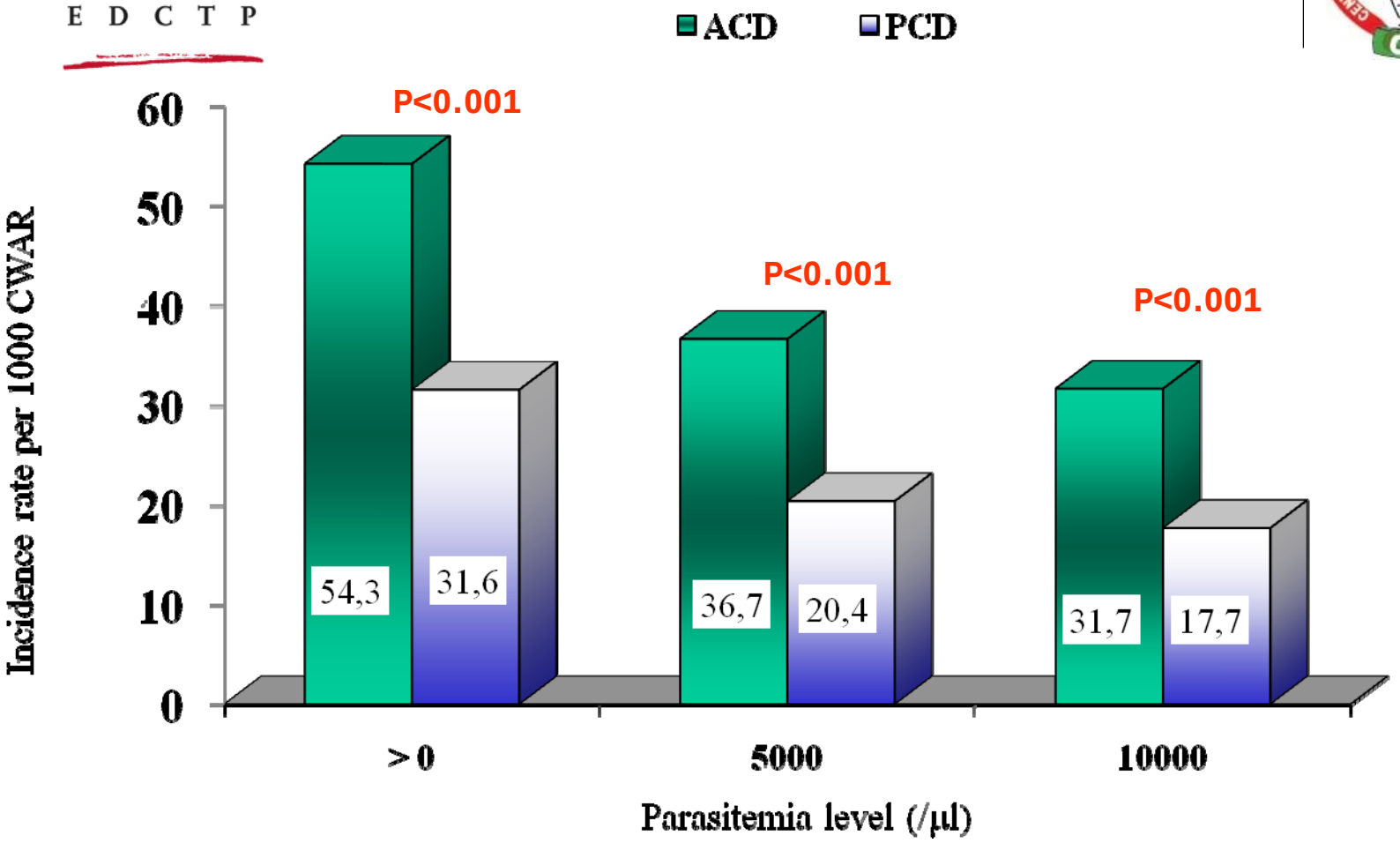

Figure 1 : Incidence of malaria episodes according to different parasites density thresholds in the two cohorts

Results (3)

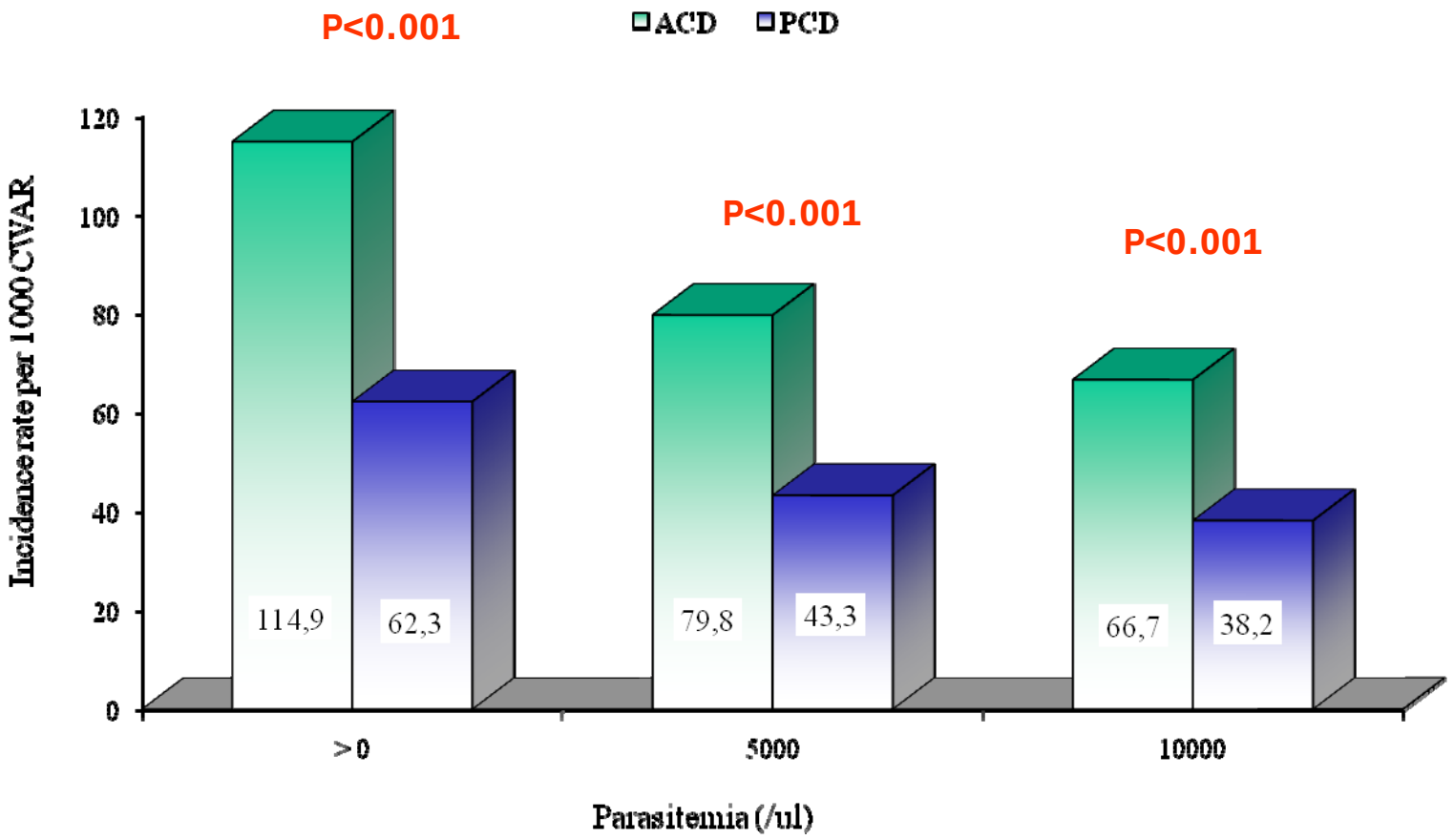

Figure 2 : Incidence of malaria episodes during the high transmission season according to different parasites density thresholds in the two cohorts

Results (4)

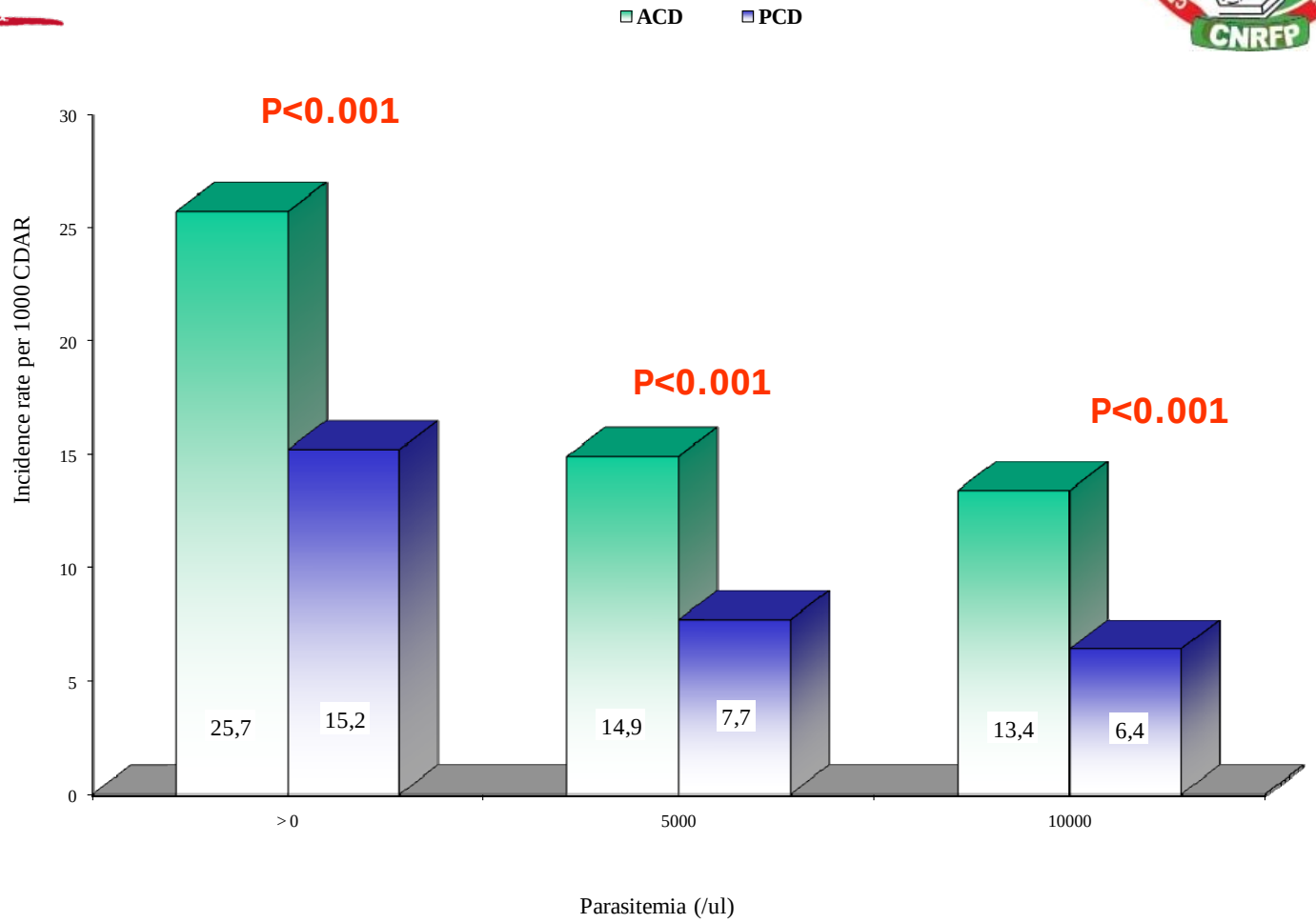

Figure 3 : Incidence of malaria episode during the low transmission season according to different parasites density thresholds in the two cohorts

Conclusions & Future perspectives

- Overall the incidence of clinical malaria is higher in the ACD cohort
- Despite the care provided free of charge the utilisation of health facilities for clinical malaria is low consequently the PCD is not the best method to assess malaria burden in High and seasonal transmission setting
- The clinical trials having clinical incidence of malaria as primary end point should consider the ACD or at least the enhanced PCD as the options for assessing the disease burden