Health system factors associated with correct use of artemether- lumefantrine for management of uncomplicated malaria in rural Tanzania

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Background

Poor adherence to and inappropriate use of antimalarials leads to ineffective cure and promote development of drug resistance.

We assessed quality of malaria case management in two areas with health and demographic surveillance systems in rural Tanzania to ascertain health worker and facility factors that influence correct prescription and correct dosing of an artemisinin based combination therapy (ACT); Artemether-Lumefantrine (ALu).

Methods

Exit interviews were conducted to all patients attending for initial illness consultation at health facilities. We collected information about health worker's training, supervision visits and inventoried facility capacity and availability of medical products related to care of malaria patients.

Data were double entered in EPI data and analyzed in STATA version 10
We used logistic regression to assess association of different health system factors to correct use of ALu.

The outcomes variables were correct treatment, correct dosing and receiving counselling messages, and the predictors were a range of health worker, health facility and patient factors.

Results

Total of 1471 patients were included in this analysis. Majority of patients were seen in dispensaries 70.5 %; (95% confidence interval (95%CI): 57.6-80.8) and in public health facilities 80.2% (95%CI: 72.4-86.1).

Significant predictors for correct prescription of ALu related to health workers were (table 1):

1) being seen by a health worker with ≥3 years work experience (adjusted Odds Ratio (aOR) 2.6; 95%CI1.2-5.6)

2) health worker of a lower cadre such as a nurse aide (aOR 4.2; 1.5-11.7)

Overall, correct dosing of AL was better by weight than by age. Factors associated with correct dosing of ALu were (table 2):

- Patients aged : 3-12years had lower odds of correct dosing than patients aged less < 3 years

- Having malaria diagnostic test and a positive malaria test result increased odds of correct treatment (aOR 1.9 ;1.1-3.2)

- administering the first dose under direct supervision as recommended by national guidelines lowered the odds of correct dosing by weight (aOR 0.5; 0.2-0.8)

Table 1: Multivariate analysis of health workers factors associated with correct prescription of ALu (N=685)

Variable	Odds ratio	95%CI	P-value
Seen by medical officer	Ref		
Seen by a clinical officer	3.1	1.21-8.00	0.019
Seen by a nurse aide or lower cadre	4.2	1.49-11.65	0.007
Other factors:			
Seen by HW with ≥3 years of work experience	2.6	1.16-5.63	0.021
Seen by HW with supervision last 6 month	1.2	0.57-2.70	0.58
Seen by HW within-service training in malaria	1	0.58-1.87	0.892
Seen by HW who owns treatment job aids	1.1	0.60-1.82	0.873

Table 2: Multivariate analysis of health facility factors associated with correct prescription of ALu (N=503)

Health Facility Factors		Dosing by age OR (95%CI)	Dosing by weight OR (95%CI)
Type of facility:	Dispensary	Ref	
	Health Centers + hospital	1.25 (0.68- 2.31)	0.62 (0.27- 1.44)
Facility ownership:	Public HFs	Ref	
	Non-public HFs	1.55 (0.81- 2.96)	0.91 (0.39- 2.12)
Products availability:	HF with a scale for all age	0.63 (0.39- 1.00)*	0.78 (0.41- 1.47)
	HF with AL in stock	0.88 (0.36- 2.13)	0.54 (0.24- 1.22)
Other factors:	Swallowing 1st dose at HF	0.69 (0.39- 1.23)	0.49 (0.27- 0.88)*
	Malaria test performed at HF	1.08 (0.55- 2.12)	1.91 (1.11-3.28)*
Patient age: (co-linearity)**	Less than 3yrs	Ref	
	3 and les 9yrs	0.02 (0.01- 0.04)**	0.20 (0.11- 0.44)*
	9 and less 12yrs	0.00 (0.00-0.02)**	0.17 (0.04- 0.63)*
	12yrs and above	0.07 (0.01- 0.78)**	1.83 (0.21- 16.86)

Conclusion

Work experience seems to be a significant predictor of health workers' compliance to treatment recommendation.

Availability of medical products at health facility and patient characteristics are shown to influence correct use of treatment recommendations .

The need to develop targeted interventions to address health system bottlenecks that affect quality of care; such as in-availability of medical products is becoming more apparent.