Use of intrarectal and injectable artesunate as treatment for severe malaria at different levels of care during the referral process: A case of three rural districts in western Uganda

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Introduction

- In Uganda severe malaria is responsible for 35% of hospital admissions, and 9-14% of hospital deaths, most of which are in children below five years.
- Injectable artesunate (Inj AS) has been the recommended medicine for the treatment of severe malaria in Uganda since 2011.
- At lower health facilities including the community level where treatment for severe malaria is not available, intrarectal artesunate (Ir AS) is used as pre-referral treatment.
- Ir AS interrupts disease progression, by rapidly reducing the parasite load thereby reducing mortality and permanent disability.
- An understanding of the use of Inj AS and Ir AS at different levels of care during the referral process will assist in policy decision making regarding use of pre referral Ir AS and Inj AS.

Objectives

General objectives:

To evaluate the interplay in the use of Ir AS and Inj AS as treatment for severe malaria at different levels of the continuum of care in Uganda in order to develop an evidence-based integrated pathway for the management of severe malaria.

Specific objectives:

- To determine the proportion of severe malaria patients who received the recommended pre-referral treatment for severe malaria at different levels of the formal healthcare in Uganda.
- To establish the follow up treatments given to patients who received the recommended pre referral treatment for severe malaria at referral facilities in Hoima, Kiboga and Kyakwanzi districts in Uganda.
- To establish the proportion of patients who received Inj AS following Ir AS as pre referral treatment.
- To determine the duration of parenteral therapy for severe malaria at referral facilities in the three mid-western districts in Uganda.

Methods

- Retrospective review of patient charts for severe malaria treatment practices for children under five years at referral facilities (Health Centre level IV and hospitals) between January 2012 and December 2014 in three selected districts (Hoima, Kiboga and Kyankwanzi) in mid-western Uganda.
- Treatment records of all children under five with severe malaria were identified and complete records were reviewed. Sample size of 769 patient records was determined using Kish and Leslie.
- The number of records included in the study for each facility was determined using population density of the workload. To account for workload, effective workload was computed. A referral hospital was allocated a weight of 1.4, a hospital 1.2 and a Health Centre IV 1.0. Hoima contributed 394 cases, 196 from Kiboga and 179 from Kyankwanzi.
- A random sample from the complete records was selected for each facility and study information extracted from the selected records onto the data collection tool.

Table 1: Summary of information extracted from patient records per study objective

No	Outcome measure	Source document
1	Proportion of severe malaria cases that received the recommended pre referral treatment	Patient notes and patient referral slips if available
2	Proportion of severe malaria cases that received different types of follow-up treatment following the recommended pre referral treatment	Patient treatment notes
3	Proportion of severe malaria who received inj AS following pre referral treatment with Ir AS	Patient treatment notes
4	Proportion of cases who received at least three doses of Inj AS treatment.	Patient treatment notes

Results

Characteristics of the participants

- Age: Ages 1 to 4 years. 14% were below one year and 86% were above 1 year
- Gender: 52% male 48% female
- 97% of patients were first time admissions into the facility for that episode. Only 22% of children were referred to facility while only 11% presented a referral form from the referring institution
- Of the 771 patients admitted 22% were referred from lower health facilities and community health workers (CHW) and 78% were non-referrals

Pre-referral medication

- Of the 169 cases that were referred, 21.9% were given Ir. AS, 42.6% were given another anti-malarial while 35.5% were given no pre-referral medication
- Patients referred from private clinics (63.9%) were more likely to have received Ir AS, followed by those referred from community health workers (18.9%) and private hospital (8.8%)
- No significant differences were seen in age and gender of child by receipt of Ir AS

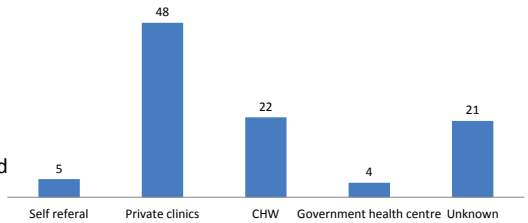

Figure 1: Percentage distribution of referring facilities

Table 2: Duration of parenteral therapy

Characteristic	Mean in days (SD)	Median in days (iqr)
Age (in completed years)		
0	2.47 (1.33)	2 (1)
1	2.66 (1.37)	2 (1)
2	2.20 (1.33)	2 (2)
3	2.38 (1.27)	2 (1)
4	2.26 (1.35)	2 (1)
Sex		
Male	2.38 (1.35)	2 (1)
Female	2.42 (1.34)	2 (1)
Overall	**2.39 (1.34)**	**2 (1)**

Follow up treatment after admission

Among the 169 referred patients:

- 63.9% received Quinine only
- 26.6% received Inj AS only
- 4.1% received Artemether only
- 4.1% patients received Artemether and Quinine
- 1.2% received Inj AS and Quinine
- Quinine was the most prescribed follow up medication irrespective of the pre-referral medicine
- Quinine was received as follow up treatment by 45.9% of patients who received Ir AS pre referral
- Patients who received Ir AS pre referral were more likely to receive Inj AS as follow up medicine (40.5%), followed by those who received no medicine pre-referral (30%) and those who received antimalarials (16.7%) before referral

Among non referrals:

- 70.7% received Quinine only
- 22.3% received Inj AS only
- 2.3% received Artemether only
- 1.7% patients received Artemether and Quinine
- 1.3% received Inj AS and Quinine

Conclusion

Use of the recommended pre-referral treatment at lower health facility and by village health teams (community health workers) is still limited in Hoima, Kiboga and Kyankwanzi districts. Sensitisation of the lower health facility health workers and village health teams to the current guidelines of managing pre-referral patients with severe malaria remains very important.

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