MANAGEMENT OF ACUTE MALARIA PRESENTATIONS IN CONNOLLY HOSPITAL APRIL-DECEMBER 2024

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BACKGROUND

Imported malaria occurs in those who have returned to, or arrived in, Ireland from malaria-endemic areas. Eighty-nine cases of malaria were notified in Ireland in 2023, mostly *P. falciparum* infection. This is a 4.5-fold increase over the last 20 years[1]. Malaria hospitalisations utilised 1,166 bed days in the Irish health service from 2016-2020[2]. The HSE Dublin & North East region has the largest, youngest, most rapidly expanding and most ethnically diverse population in the country[3]. Connolly Hospital sees the second highest number of malaria presentations in the Republic of Ireland.

In low incidence settings, imported malaria with avoidable deaths continues to be a challenge. International guidelines recommend:

(i) results of a parasitological diagnosis should be available within a short time (<2 h) of the patient presenting
(ii) Rapid diagnostic tests (RDTs) should be used if quality-assured malaria microscopy is not readily available"[4]
(iii) RDTs positive for *P. falciparum* should have a blood film immediately examined to estimate parasitaemia, whereas RDTs positive for non-falciparum species can be read the next day if necessary.
(iv) Positive results should be communicated to the requesting clinician within 4 hours of the sample reaching the laboratory
(v) Antimalarial treatment should be commenced as soon as a positive malaria result is received[5]
(vi) IV artesunate is indicated for severe malaria, or for non-severe *P. falciparum* malaria if patients are unable to tolerate oral medicines.

In contrast to Model 4 hospitals, which have out-of-hours haematology laboratory services, Model 3 hospitals often operate out-of-hours laboratories where a single biomedical scientist staffs a reduced repertoire of diagnostics. Most of these do not have competencies in making and reading blood films, which are deferred until the following weekday. Thus, despite the higher burden of disease in many of these hospitals, malaria-specific diagnostics are restricted for out-of-hours presentations. Both intravenous and oral formulations of artemisinin derivatives are unlicensed medicines and thus usually non-stock items which require internal procurement procedures. Infrequent exposure to these scenarios can lead to delays by medical, nursing and pharmacy staff.

METHODS

A prospective listing of all malaria presentations referred to Infection specialists (Clinical Microbiology/Infectious Diseases) has been maintained since April 2024. A retrospective review of 14 episodes in 12 patients presenting with malaria infection between April-December 2024 was done. A combination of chart review and interrogation of the hospital haematology laboratory reporting system was used and data collated using MS Excel. Results are descriptive.

AIMS

To explore the recognition and management of patients presenting with malaria to Connolly Hospital, by measuring timepoints including:

i. Emergency Department (ED) registration
ii. Malaria blood test collection time
iii. Rapid Diagnostic Test result time
iv. Blood film reporting time
v. Time of administration of first dose antimalarial

Severe malaria is usually evident by using routine blood tests and clinical signs alone. Given that parasitaemia resulting may be delayed until 1-4 days after initial positive malaria test in our setting, we explored the hypothesis that it is likely safe to define antimalarial treatment choice in the absence of a parasite count.

RESULTS

Twelve adult patients with 14 episodes of malaria were included. Delays in relevant processes from arrival to treatment are summarised in Table 1, and demonstrate delays between presentation and testing, and between availability of positive result to treatment..

	Median time (IQR)
ED registration to administration of 1st dose antimalarial	12.73 hours (9.78 – 23.53)
ED registration to collection of malaria test sample	5.68 hours (1.05 – 10.58)
ED registration to resulting of positive malaria result	8.35 hours (3.46-15.5)
Collection of blood sample to resulting of positive malaria result	1.4 hours (0.95 – 1.9)
Collection of blood sample to resulting of blood film	13.3 hours (7.23 – 16.75)

Table 1: Timing of specimen collection and result reporting

Plasmodium falciparum accounted for 10 of 14 presentations (71%). The median parasitaemia reported for *Plasmodium falciparum* was 1.35%. There was significant delay (13.3 hrs) in the reading of blood films for speciation and parasitaemia, but turnaround time for rapid test resulting was prompt (1.4 hrs).

Two of 14 episodes were classified as severe malaria (14%) on initial assessment as evidenced by a low GCS on presentation in one patient, and a severe acute kidney injury in the other. One further episode would have been reclassified as severe if parasitaemia had been available same day (7%). Half of episodes were treated with IV artesunate as first line antimalarial treatment, even though it was only indicated in 3 episodes (21%), suggesting that 79% of patients should have received oral artemisinin-based combination therapy (ACT) as first line instead. Four (29%) episodes were uncomplicated non-falciparum malaria and could equally have been treated with chloroquine-based regimens.

CONCLUSION

There was variability in the timely identification and treatment of malaria presentations to Connolly Hospital, with potentially modifiable delays in multiple processes. Despite the significant delay in blood film reporting, there is scope for improvement in time to testing, stratification of P.falciparum as severe or non-severe, choice of initial treatment regimen and time from result to first dose antimalarial.

RECOMMENDATIONS

Several interventions have been implemented on the basis of these findings. A supply of ACT is now stocked in ED. Reporting of RDTs on the lab system has been modified from the previous 'positive or negative' to include which bands are positive and an interpretive comment (e.g., P. *falciparum*, non-PF or mixed infection) following engagement with Haematology biomedical scientists. Internal malaria guidelines are being updated to include recommendations to commence treatment in the Emergency department prior to onward referral, to base the use of IV therapy for severe malaria on readily available parameters, and conversely to encourage the use of oral ACT for patients with non-severe malaria prior to blood film report, particularly for semi-immune patients who are able to tolerate oral intake.

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