Treatment of uncomplicated Plasmodium falciparum malaria in Myanmar: a clinical decision analysis
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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
The use of chloroquine (CQ), sulphadoxine-pyrimethamine (SP), and mefloquine (MFQ) for the treatment of uncomplicated plasmodium falciparum malaria in Myanmar.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised 1,000 hypothetical cases of adult uncomplicated falciparum malaria, who attended a public malaria clinic in Myanmar.

Setting
The setting was a public malaria clinic. The economic analysis was carried out in Myanmar.

Dates to which data relate
The effectiveness and resource use data were collected from studies published between 1992 and 1999. The cost data were collected from a study published in 1998. The price year was not reported.

Source of effectiveness data
The effectiveness data were derived from a review of the literature. In addition, the authors made estimates and assumptions about effectiveness.

Modelling
A decision analytical model was used to synthesise data from various sources. This was used to determine the cost-effectiveness of the three drug regimens for the treatment of uncomplicated plasmodium falciparum malaria in Myanmar.

Outcomes assessed in the review
The review assessed therapeutic response, the probabilities of compliance, death rates, and the number of deaths prevented. The three levels of therapeutic response assessed were adequate clinical response (ACR), early treatment failure (ETF), and late treatment failure (LTF).
Study designs and other criteria for inclusion in the review
The probabilities of therapeutic efficacy were obtained from an empirical study in Myanmar (see Other Publications of Related Interest). The probabilities of compliance were derived from a survey of the literature reporting data from countries with situations similar to that in Myanmar. The death rates were extracted from the National Malaria Control Project. The number of deaths prevented was derived from the case fatality rate data for malaria in Myanmar.

Sources searched to identify primary studies
Not stated.

Criteria used to ensure the validity of primary studies
Not stated.

Methods used to judge relevance and validity, and for extracting data
Not stated.

Number of primary studies included
At least three primary studies were included in the review.

Methods of combining primary studies
Not stated.

Investigation of differences between primary studies
Not stated.

Results of the review
With CQ treatment, the probability of ACR was 0.666, the probability of ETF was 0.18, and the probability of LTF was 0.154.

With SP treatment, the probability of ACR was 0.647, the probability of ETF was 0.206, and the probability of LTF was 0.147.

With MFQ treatment, the probability of ACR was 0.934, the probability of ETF was 0.044, and the probability of LTF was 0.022.

The probabilities of compliance were 0.8 with CQ treatment, 0.95 with SP treatment, and 0.95 with MFQ treatment.

A case fatality rate of 3% was used for possible death in uncured cases.

Methods used to derive estimates of effectiveness
The authors made assumptions about the additional effectiveness estimates.

Estimates of effectiveness and key assumptions
None of the drugs studied exhibited serious side-effects. The probability of death as a function of uncured cases was similar in all three regimens. There was a linear relationship between treatment compliance and effectiveness.
Measure of benefits used in the economic analysis
The measures of benefits used were the number of cases cured and the number of deaths prevented.

Direct costs
The authors did not report if the direct costs were discounted. The quantities and costs were reported separately. The direct costs were the drug costs incurred by the provider. The quantity/cost boundary adopted was that of the malaria clinic. The drug costs were taken from a report by the National Malaria Control Project. The price year was not reported.

Statistical analysis of costs
No statistical analysis was reported.

Indirect Costs
The indirect costs were not included.

Currency
US dollars ($).

Sensitivity analysis
A univariate sensitivity analysis was conducted on the therapeutic efficacy of the drugs.

Estimated benefits used in the economic analysis
The benefits were not reported separately (see the 'Synthesis of Costs and Benefits' section).

Cost results
The total drug costs for treating 1,000 adult malaria cases were $75.00 with CQ, $75.00 with SP, and $1,500.00 with MFQ.

Synthesis of costs and benefits
The cost per case cured ranged from $0.14 to $0.61 with CQ, from $0.12 to $0.54 with SP, and from $1.69 to $71.77 with MFQ.

The cost per death prevented ranged from $0.58 to $2.51 with CQ, from $2.39 to $10.52 with SP, and from $33.11 to $1,405.81 with MFQ.

When the therapeutic efficacy of the drugs was varied, SP was the most cost-effective drug per case cured, and CQ was the most cost-effective drug per death prevented.

Authors' conclusions
Sulphadoxine-pyrimethamine (SP) was the most cost-effective drug for curing a case of malaria, whilst chloroquine (CQ) was the most cost-effective drug for preventing a death. At the present price and therapeutic efficacy, mefloquine (MFQ) was the lowest cost-effective regimen for both indicators of effectiveness.

CRD COMMENTARY - Selection of comparators
No explicit justification was given for the comparators used. You should decide if these health technologies are relevant.
to your setting.

**Validity of estimate of measure of effectiveness**

The effectiveness estimates were taken from a small number of studies. The authors undertook a review of the literature to derive estimates for the model. This seems to have been appropriate, although they did not state whether a systematic review of the literature had been undertaken. More information about the design and the process of the review would have been useful.

The authors based their analysis on a number of assumptions, which were not justified. In addition, they noted the existence of geographical variations in drug efficacy, but did not incorporate them in the analysis. The authors did not consider the effect of the three drugs on the level of resistance, or the selection of each drug as first-line or second-line treatment. Sensitivity analyses on compliance or death rates were not performed.

**Validity of estimate of measure of benefit**

The benefits were estimated directly from the effectiveness analysis, although they were not reported separately.

**Validity of estimate of costs**

There were several good features of the cost analysis. The drug costs were included, and the quantities and costs were reported separately, thus enhancing the generalisability of the results. The cost estimates were derived from a single study. However, no sensitivity analysis was conducted on costs. In addition, the analysis did not consider the cost of switching to another treatment in case of treatment failure, the cost of treating complications, and the indirect costs to the patients. Finally, the price year was not reported, which would make reflation exercises in other settings problematic.

**Other issues**

The authors did not make appropriate comparisons of their findings with those from other studies and did not address the issue of generalisability to other settings. The authors do not appear to have presented their results selectively. The study considered adults suffering from uncomplicated falciparum malaria attending a public malaria clinic in Myanmar, and this was reflected in the authors' conclusions.

In terms of generalisability, the authors did not report the baseline characteristics of the study population. In addition, they did not compare the results with those of other regimens such as quinine and tetracycline, artesunate, and artesunate and MFQ combined.

**Implications of the study**

The authors made the following recommendations:

- SP should be available at the peripheral level;
- MFQ should be kept for emergency use, and only made available at the peripheral level with a strict utilisation policy;
- there should be continuous monitoring of drug efficacy levels in Myanmar; and
- drug selection should be based on the area-specific therapeutic efficacy of antimalarial drugs.

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**Bibliographic details**

Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
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