Malaria Chemoprophylaxis: What Do the Travelers Choose, and How Does Pretravel Consultation Influence Their Final Decision

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Abstract. Three different drugs (mefloquine, atovaquone/proguanil, doxycycline) are recommended for malaria chemoprophylaxis, each with approximately the same efficacy but various adverse event profiles, regimens, and prices. We investigated which medication the travelers would have chosen on the basis of written evidence-based information and the impact that pretravel consultation had on their decision. A prospective study was performed in a travel clinic and private practice, and 1073 travelers were included; 45% chose mefloquine (Lariam or Mephaquine), 21% atovaquone/proguanil (Malarone), 18% doxycycline (Supracycline), 5% “no prophylaxis,” and 11% “do not know.” Lariam was particularly chosen because of prior experience (38%), Mephaquine because of low price (34%), and doxycycline and Malarone because of the profile of adverse events (55% and 43%, respectively). Based on objective written information, travelers most frequently chose mefloquine for chemoprophylaxis. This suggests that evidence-based information weighs more heavily than negative publicity. Taking into account the perspective of the user should improve appropriateness of the pretravel advice.

INTRODUCTION

Increasing numbers of travelers are visiting countries where malaria prophylaxis is advised. Three different drugs are currently recommended by WHO for that purpose: mefloquine, atovaquone/proguanil (Malarone), and doxycycline. In Switzerland, no preference is made between these drugs, and the choice is left to the travelers and physicians. Indeed, there is little difference in terms of rates of adverse events (AEs) and efficacy.1,2

It is clearly established that good acceptability of the prescribed drug by the patient or traveler is essential to achieve good adherence. Acceptability is one of the criteria used for the appraisal of guidelines AGREE (Appraisal of Guidelines for Research and Evaluation, www.agreecollaboration.org). Therefore, in addition to the usual indications and contraindications, acceptability should be taken into account when prescribing an antimalarial chemoprophylaxis, especially in populations likely to be poorly adherent.3 This is reinforced by the repeated observation that adherence to antimalarial chemoprophylaxis is generally low.4–7

In the present study, we aimed to investigate the type of drug preferred by the traveler when he/she is given written information only about safety details, efficacy, regimen, and price for the three different drugs [mefloquine (Lariam and Mephaquine), atovaquone/proguanil (Malarone), and doxycycline (Supracycline)]. They were then requested to fill a form that included their preferred option for chemoprophylaxis (without any information on medical contraindications), the main reason(s) for their choice (open question), and sociodemographic data. The possible responses included “Lariam,” “Mephaquine,” “Malarone,” “Supracycline,” “I don’t want any prophylaxis,” and “I don’t know.” After giving back the form in a sealed envelope, the client attended the pretravel consultation where the health worker was unaware of the traveler’s initial choice. During the consultation, options for chemoprophylaxis were discussed again, using the same table as the one provided in the waiting room. Contraindications were elicited, and changes in chemoprophylaxis type were made accordingly. The final prescription choice was then recorded on the back of the envelope as well as the reasons for the choice, including potential medical contraindications.

The protocol was approved by the ethics committee of the University of Lausanne in September 2003.

Enrollment into the study was proposed to all travelers of age >16 years presenting to the travel clinic or to the private practice and intending to travel to a destination where chemoprophylaxis was recommended (according to the 2003 recommendations edited by the Swiss Federal Office of Public Health, “Prévention du Paludisme 2003, Mars 2003,” Bulletin OFSP 2003, no. 14)

After oral consent, they were asked to read carefully in the waiting room a colored table comparing rates of adverse events, efficacy, regimen, and price for the three different drugs [mefloquine (Lariam and Mephaquine), atovaquone/proguanil (Malarone), and doxycycline (Supracycline)]. They were then requested to fill a form that included their preferred option for chemoprophylaxis (without any information on medical contraindications), the main reason(s) for their choice (open question), and sociodemographic data. The possible responses included “Lariam,” “Mephaquine,” “Malarone,” “Supracycline,” “I don’t want any prophylaxis,” and “I don’t know.” After giving back the form in a sealed envelope, the client attended the pretravel consultation where the health worker was unaware of the traveler’s initial choice. During the consultation, options for chemoprophylaxis were discussed again, using the same table as the one provided in the waiting room. Contraindications were elicited, and changes in chemoprophylaxis type were made accordingly. The final prescription choice was then recorded on the back of the envelope as well as the reasons for the choice, including potential medical contraindications.

The original table comparing the different drugs was in French (cf. Table 1, which is in English) and included the following categories: brand name, efficacy, rate of AEs with overall frequency, and frequency of AEs that required a
Table 1
Chart provided to the traveler prior to the pretravel consultation comparing the different drugs available for malaria prophylaxis; traveler was asked to make his/her choice after reading this table.

<table>
<thead>
<tr>
<th>Name of antimalarial tablet</th>
<th>Level of protection</th>
<th>Efficacy</th>
<th>Adverse-events</th>
<th>Regimen</th>
<th>Price</th>
</tr>
</thead>
</table>
| Lariam (Mephaquine)        | 90%                  | 88%      | 11%            | Anxiety, headache, dizziness, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, depression, dizziness, 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(6%), and miscellaneous (16.3%) (see Figure 1). Figure 2 shows the same categories of reasons but for each drug separately. Lariam was principally chosen because it had already been used in previous travel (38%), Mephaquine because of the low price (34%), and doxycycline and Malarone because of their profile of adverse events (55% and 43%, respectively).

Demographical characteristics that influenced the choice of chemoprophylaxis were as follows: age 21–40 years, which led to less mefloquine ($P = 0.04$) and less prophylaxis all together ($P = 0.02$). Travelers of low socioeconomic classes were less likely to use Malarone ($P = 0.03$). Clients coming from malaria-endemic countries chose more often mefloquine ($P < 0.01$). Women were less likely to take doxycycline ($P < 0.01$) and preferred Malarone ($P < 0.01$). Long-term travelers (>6 weeks) were less likely to choose doxycycline ($P = 0.04$) or to use Malarone ($P = 0.01$) and more likely to choose doxycycline ($P = 0.01$). Travelers who had used chemoprophylaxis in the past were more likely to use mefloquine ($P < 0.01$). Among those who had used mefloquine in the past, 65% were willing to use it again versus 30% and 36% among those who had used another drug or had never taken any prophylaxis, respectively. Figures 3–8 show the proportions of travelers choosing each drug according to different demographic characteristics.

After the pretravel consultation, choices of prophylaxis were as follows (see Table 3): mefloquine 50% (Lariam 13%, Mephaquine 37%), atovaquone/proguanil 23%, doxycycline 19%, no prophylaxis 6%, chloroquine/proguanil 1%; 47% of the travelers decided to change their prophylaxis choice after the consultation. The proportion of change for each type of drug was 61.8% for Lariam, 29.9% for Mephaquine, 28.7% for atovaquone/proguanil, 37.2% for doxycycline, and 60% for those who did not chose any prophylaxis; 14% had medical contraindications for at least one of the drugs initially chosen. Other reasons given for change were as follows: overall discussion with medical staff (12%), price (8%), adverse events (8%), miscellaneous (19%), and unknown (32%). The most significant change was from Lariam to Mephaquine, and the reason was that the travelers did not realize when reading in the waiting room that it was the same drug.

There was no significant difference in the distribution of specific drugs prescribed between the 9 different health professionals of the travel clinic. On the other hand, the private practitioner tended to have more travelers exiting his consultation with atovaquone/proguanil (44% versus 20% at the travel clinic) ($P < 0.01$), but the initial choice of atovaquone/proguanil was also higher before consultation (34% versus 20% at the travel clinic). The socioeconomic profiles of the travel clinic and the private practice were not statistically different ($P = 0.12$).

**DISCUSSION AND CONCLUSIONS**

When given objective written information on the different drug options for malaria chemoprophylaxis, almost half of the travelers chose mefloquine (Lariam or Mephaquine), and two-thirds of those who had taken it in the past were willing to take it again. These findings contradict the usual assumption that mefloquine, and especially Lariam, is disliked by most travelers. The fact that the reputation of mefloquine is assumed to be bad among travelers was the basis for us to undertake this study because we felt concerned by the possible negative impact of bad publicity on adherence to our recommendations.5–12 This study confirms the appropriateness of continuing to recommend mefloquine to travelers without contraindication as a chemoprophylaxis option to prevent malaria. It shows that travelers rely more on evidence-based information than on anecdotal reports highlighted by the media. Health providers often believe that the rate or type of AEs is the most important determinant of decision making for chemoprophylaxis, but this study shows that price also influences the decision, especially when most travelers pay for the drug themselves.
Using a written information sheet may prove useful to ease the work of travel clinic personal because it allows travelers to have more time to think of what is best for them and therefore to make a more informed decision; travelers might also be less biased by the staff opinion.

Pretravel consultation had an important impact on the traveler’s final choice. Indeed, almost half of the clients changed their mind after discussions with medical staff. Apart from medical contraindications that accounted for about a third of these changes, the discussion seemed to be instrumental in putting into perspective all the different aspects of drug usage so that the traveler could make a more informed decision. For
example, most of the patients who switched from Lariam to Mephaquine did it because it was cheaper. They did not recognize the similarity of the drug until the medical attendant highlighted it, but they did notice the difference in price. The fact that these changes did not lead to prescription of one predominant drug highlights the rigor of the health staff to avoid communicating to the traveler any personal preference for a particular type of chemoprophylaxis. The figure of 6% of travelers choosing not to take any prophylaxis for their trip, with little impact of the consultation on this rate, is quite high. This informed choice is unlikely to be modified much by further information, and experience shows that when insisted upon, these travelers might well begin prophylaxis but will be the first to stop when any symptom occurs, even if unrelated to the drug.

A problem of malaria chemoprophylaxis is that of travelers stopping their medication during the travel, most often mefloquine, because they hear about bad experiences from other travelers. Even if the study was not designed to measure adherence to chemoprophylaxis (already done in the past, see Ref. 7), we can assume that a choice made on the basis of written information may positively influence adherence to the prophylaxis. Travelers may indeed be less likely to stop their prophylaxis during the trip because they have been better informed on the different aspects of the chemoprophylaxis and will therefore be less influenced by experiences of others.

We noted that atovaquone/proguanil was more often prescribed in the private practice than in the travel clinic. We cannot find a definite explanation for that difference, especially as socioeconomic levels as well as other demographic variables were similar in both sites. The power to detect a difference was, however, low because of the low number of consultations performed by the private practitioner.

Because these data were collected in only 2 health facilities in the French-speaking part of Switzerland, the results may not apply to all travelers of other countries. However, it is likely that we have captured a general trend reflecting the usual determinants of travelers’ choices. The proportion of travelers choosing one particular drug or another may be different in another country, depending on the dissemination of media reports on serious adverse events, on national chemoprophylaxis policy, and on the influence of promotion by drug companies. This study shows that travelers are sensitive to evidence-based information, and that they have determinants for their choices that differ from those of health professionals. This difference should be taken into account when developing recommendations. Considering the perspective of the user should improve appropriateness of the pretravel advice as well as adherence to chemoprophylaxis, but the latter still needs to be demonstrated.

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