Available online at www.sciencedirect.com
SCIENCE DIRECT®
Health Policy 77 (2006) 279–289
HEALTH policy
www.elsevier.com/locate/healthpol

Perceptions on use of sulfadoxine–pyrimethamine in pregnancy and the policy implications for malaria control in Uganda

Anthony Kabanza Mbonye *, Stella Neema, Pascal Magnussen

Community Health, Ministry of Health, Kampala, Uganda

Abstract

In malaria endemic areas intermittent treatment with sulfadoxine–pyrimethamine (SP) is recommended for malaria prevention in pregnancy. Yet, data on perceptions regarding use of this drug are scarce. An exploratory study was conducted to assess perceptions on SP in Mukono district, Uganda. This is an initial step towards a review of the policy aimed at improving access and use of SP in pregnancy, which is currently low. Results show that SP is perceived to be an effective drug that cures malaria quickly. However there are negative perceptions related to its use in pregnancy. SP is believed to be strong and weakens pregnant women, causes abortions and foetal abnormalities. There is also a perception that resorting first to SP for malaria treatment may lead to the development of drug resistance. This perception may limit access to effective treatment of malaria in this community since the policy in Uganda recommends SP in combination with chloroquine as the first-line treatment. The policy implications of these findings include developing a health promotion package to demystify the misconceptions on the strength of SP, to explain its benefits and side-effects. This package will involve giving health workers refresher training on communication and counselling on use of SP in pregnancy targeting special groups like pregnant adolescents. These results provide important lessons to policy makers and programme managers who aim at scaling up access of SP for malaria prevention in pregnancy.

Keywords: Malaria in pregnancy; Perceptions; Sulfadoxine–pyrimethamine; Uganda

1. Introduction

It malaria endemic countries, pregnant women and children under five years of age are most susceptible to malaria [1–3]. In areas of high transmission, malaria in pregnancy presents as an asymptomatic infection with parasite sequestration in the placenta, leading to severe anaemia and low birth weight and subsequent increase in infant and childhood mortality [4–6]. To prevent the negative effects of malaria in pregnancy and on birth outcome, WHO recommended that in malaria endemic areas, all pregnant women should be offered malaria chemoprophylaxis or intermittent preventive treatment (IPT) [7]. Similarly, African countries adopted the Roll Back Malaria Strategy in 2000, to control malaria on the continent and recommended increased access to IPT by pregnant women [8].

Chemoprophylaxisis, where sub-therapeutics doses are given at specific intervals has been found to be effective in reducing incidence of malaria episodes, maternal parasiteamia, severe anaemia and of low birth

* Corresponding author. Tel.: +256 77411668.
E-mail address: vpadmn@infocom.co.ug (A.K. Mbonye).

0168-8510/$ – see front matter © 2005 Elsevier Ireland Ltd. All rights reserved.
doi:10.1016/j.healthpol.2005.07.020

weight [9,10]. Chemoprophylaxis has also been shown to reduce infant mortality by about one-fifth in children of primigravidae [10]. Although chemoprophylaxisis is highly effective in reducing morbidity among pregnant women, it is difficult to sustain, and in some studies, it has been shown to impair development of naturally acquired immunity [11,12].

IPT (full therapeutic doses) given at defined intervals has potential benefits and is a promising strategy in malaria control [11–13]. Studies conducted in Kenya, Malawi and elsewhere have shown that IPT with SP given twice during pregnancy can reduce malaria episodes, severe anaemia and improve birth weight [14–19].

Despite implementation of IPT in some countries, low compliance to this intervention is reported, and has also been attributed to late antenatal care (ANC) attendance [18]. A recent study conducted in Malawi on the use of IPT in ANC clinics found that although 90% of the pregnant women knew that SP was recommended during pregnancy, only 36% received the recommended two-dose regimen especially among multigravidae women [20]. In Kenya, despite 96% of the providers being aware of IPT with SP, only 5% of the pregnant women interviewed had received two or more doses of SP and constraints in commodity supply and high cost of accessing services were cited [21].

In Uganda, it is estimated that 1.2 million pregnant women suffer from malaria morbidity annually. Accordingly, Uganda's policy on prevention of malaria in pregnancy recommends IPT with two doses of SP given during the second and third trimester of pregnancy to women of all parities attending antenatal care. However, the current use of malaria prophylaxis during pregnancy in Uganda is low with only 34% of women taking malaria prophylaxis during pregnancy [22].

A few studies have assessed the use of antimalarial drugs in pregnancy and found that chloroquine is widely accepted and used to treat malaria although there is fear that it causes abortion [23–25]. In a study to ascertain the safety of chloroquine, proguanil, sulfadoxine–pyrimethamine and mefloquine in the first trimester, it was concluded that neither drug was associated with a higher risk than that caused by *P. falciparum* malaria in pregnancy [26]. It has also been found that there is no literature to support the hypothetical risk of kernicterus in the newborn following exposure to antimalarial drugs containing sulphonamides or sulphones [27]. A recent review on drug toxicity has reaffirmed that SP is well tolerated in pregnancy especially in African populations where it is used as IPT. Although a combination of an artemsisnin derivative with another efficacious drug is an optimal therapeutic strategy, such combinations have not been evaluated in pregnancy and SP remains the most efficacious and safe drug for IPT [46].

The context of medicine use in developing countries has been extensively studied. A study in Cameroon found that there was wide use of drugs both from the informal and formal sectors. Use of drugs from the informal sector was associated with insufficient knowledge and information especially on their correct use. This sector however provided drug access to hard-to-reach rural populations [28,29]. In a study carried out in Uganda it was found that people rely on self-treatment with drugs mostly from the informal sector. Although government units were relatively cheap, they suffered from short opening hours, unfriendly staff and frequent unavailability of drugs [30].

Access and use of SP for malaria treatment and prevention is influenced by the health seeking behaviour of pregnant women especially for ANC services. In Kenya, use of ANC was found to be affected by a range of factors like socio-economic, cultural, accessibility to services and the timing of a pregnancy [31] Similar findings have been documented in Ghana where socio-cultural factors especially the education level of a woman was the most important determinant for using ANC [32]. In Malawi, where chloroquine was widely used for treatment but with low compliance to chemoprophylaxis, replacing the bitter chloroquine pills with a non-bitter product was found to be a significant factor in increasing compliance [24].

To our knowledge, no study has assessed perceptions on use of SP in pregnancy, although several countries in sub-Saharan Africa recommend SP for IPT in pregnancy. The aim of this study, therefore, was to explore perceptions, beliefs and practices associated with use of SP in pregnancy as an initial step towards review of a policy which aims at increasing access to malaria prevention interventions in Uganda.

Understanding people's perceptions on malaria, its causes and the available treatment options is central in planning successful interventions. People in different societies hold a variety of beliefs according to cultural,

educational, and economic factors which have direct consequences to preventive and treatment seeking behaviour as well as activities to control malaria [33–35].

The perceptions on use of SP for malaria prevention in pregnancy have been conceptualized using the Health Belief Model [36]. In this model, two main factors influence the likelihood that a person will adopt a recommended preventive action. First, a person must feel susceptible and threatened by the disease with perceived serious consequences. Secondly, the person must believe that the benefits of practicing prevention outweigh the perceived barriers to the preventive action. Therefore, four constructs can be obtained from this model: perceived susceptibility, perceived severity, perceived benefits and perceived barriers. The selection of this model to analyze the perceptions on use of SP in pregnancy is based on its previous use to predict a number of health related conditions [37,38].

2. Methods

The study was conducted in Mukono district in central Uganda. The district is one of the largest in the country with an estimated population size of 850,900. It has a population density of 179 people/km^2. The district has a rural population of 88.0% and a high fertility rate of 7.2 births/woman and an annual population growth rate of 2.3%. This district was specifically selected, to test an intervention of new community approach for distributing malaria prevention interventions, because most areas are hyper-to holo-endemic for malaria. Prior to the intervention, a formative study was undertaken to explore the perceptions on use SP in pregnancy. Data collection took place over a period of three months from November 2002 to January 2003 after the rainy season when the population was experiencing intense malaria transmission.

Data were collected using qualitative methods including focus group discussions (FGD) and key informant interviews (KII). The following thematic areas were explored.

- Perceived susceptibility and severity of malaria in pregnancy.
- Perceptions on use SP and other drugs for malaria treatment and prevention in pregnancy.
- Perceived barriers to malaria prevention and treatment services.

Study participants from different target population groups were selected from five sub-counties of the district taking into consideration their age, education, socio-economic and marital status. The sampling frame consisted of all people in the reproductive age group living in the selected areas. A similar approach has been previously used to collect data on pregnant women in a nearby district [35]. FGDs were held separately with pregnant women aged 20–49 years, non-pregnant women aged 20–49 years; adolescent girls (both out of school and those in school), aged 10–19 years and men aged 20–50 years. All respondents were able to speak fluently the local dialect. FGDs were conducted in a quiet place selected by the researchers together with the respondents to maximise comfort. Snacks and soft drinks were served at the end of the FGDs. A total of 10 FGDs were conducted in which 90 respondents participated. Fifteen of them were adolescent girls aged 10–19 years, 36 were young women aged 20–29 years and 39 were aged 30–49 years. Sixty-three participants had attained some primary education while 27 participants had secondary education and above. Sixty-eight participants were married and were engaged in peasant agriculture and petty trade. In addition to the FGDs, 40 KIIs were conducted targeting opinion leaders, local council officials, elderly midwives, retired female teachers, drug shop owners, and traditional birth attendants (TBAs), pregnant and non-pregnant women. Interviewers were trained for a period of one week by the research team and a social scientist from Makerere University. They were taken through techniques of conducting FGDs, KIIs, qualitative data recording, transcribing techniques and data analysis. Field practice was done three times to familiarise with the study protocols which were in the local language Luganda. Necessary revisions were done before commencing the study.

After fieldwork, tape recorded FGDs were transcribed in Luganda and later translated into English by two research assistants. To avoid loss of data, during analysis, frequent comparisons were made between the transcripts in Luganda and the English version and relevant sections of tapes listened to in order to get appropriate quotes. Data was initially coded separately for the Luganda and the English versions of the transcripts

and thematic areas obtained. The FGDs and KIIs from the different groups were analysed manually along constructs derived from the Health Belief model [36]. Quotes that best explained the context of SP use in pregnancy were identified. Because there were no major differences in noted from the FGDs and KIIs, the data are presented together. It was necessary to validate data from FGDs with that from KIIs and where necessary, a comparison was made with other sources especially the Uganda Demographic and Health Survey which has the most recent data on health and diseases [22].

2.1. Ethical issues

The study protocol together with the research tools were approved by the Danish National Committee for Biomedical Research Ethics and the Uganda National Council of Science and Technology. Verbal consent was obtained from all respondents who participated in the study. They received explanations on the purpose of the study and its objectives.

3. Results

3.1. Perceived susceptibility to malaria in pregnancy

In this community malaria is locally known as *omussujja* (fever). However, another term *omusujja gw'ensiri* (fever caused by mosquitoes) was used to a lesser extent. Participants were asked which people were vulnerable to malaria and whether malaria was serious problem for pregnant women. Most participants in all FGDs conducted stated that children and pregnant women were at most risk of getting malaria. In all the discussions, children were ranked as most affected followed by pregnant women. Participants reported that children sleep carelessly, do not cover themselves, they keep turning and throw away beddings while sleeping and yet use of bed nets in this community is low. In Kimenyedde and Buikwe sub-counties, participants described how malaria attacks young babies, children and old people. Women participants thought that children and pregnant women were at risk of malaria because they eat poorly and that women have no money to buy nutritious foods to keep them healthy. Pregnant women were also thought to be especially at risk of mosquito bites and hence malaria because most of them do not use bed nets. The male participants thought that pregnant women and children were vulnerable to malaria because they did not have strong blood while they considered themselves strong and not vulnerable to malaria.

Most participants in all FGDs and KIIs considered adolescents and primigravidae as being people without risk of malaria. During the discussions it was apparent that pregnant adolescents were known as a group least likely to use health services like ANC services. This is because the main response to pregnancy among adolescents is to try to have an abortion by whatever means. Non-pregnant adolescents were also perceived least likely to access services at health units.

3.2. Perceived severity of malaria in pregnancy

Most of the participants in all FGDs conducted, knew the symptoms of malaria and they were able to distinguish between mild and severe malaria symptoms. Participants referred to mild malaria as *olusujjasujja* and reported that it presents with headache, joint pains, nausea, loss of appetite, low grade fever, feeling lazy, heart palpitations and sour mouth whereas the severe type of malaria locally known as *omusujja omungi* presents with very high temperature, rigors, shivering, miscarriages, mental confusion, excess vomiting and eyes turning yellow. A type of fever locally known as *omusujja gwa nakawere* was common among women who had just delivered and was associated with feeling feverish, breast pain and sometimes lower abnormal pain. This fever was considered normal by women participants. This perception could be harmful because biomedically fever during the six weeks after delivery (peuperium) is dangerous and may be due to a pelvic infection which is one of the common causes of maternal mortality.

Most of the participants in all FGDs associated severe malaria with miscarriages although a few associated it with stillbirths. Stillbirths were also perceived to be commonly caused by *kabotongo* (syphilis). Similarly, very few participants (in 3 out of 10 FGDs) associated *nabuguma* with malaria infection because the illness presents commonly with no sign of fever. However, most of the participants in all the FGDs did not associate *nabuguma* with malaria but perceived it as a different type of disease that sometimes leads

to miscarriages. It was reported that women who get *nabuguma* became progressively weak without any symptoms like fever and the end result is a miscarriage. When participants were asked if they knew that some pregnant women might have malaria without presenting any symptoms, their unanimous response was that it was not possible. This gives an impression that many people (pregnant women, non-pregnant women adolescents and men) are not aware of the asymptomatic nature of malaria in pregnancy and its consequences.

3.3. Perceived benefits of using SP in pregnancy

We first explored the common drugs used for treating malaria in this community. Malaria and other febrile illnesses in this community are commonly treated with paracetamol, chroloquine and SP (the common brand name in the study area is Fansidar®). The common sources of these drugs are drug shops and ordinary shops. This was confirmed in all the FGDs and the KIIs conducted. Fansidar was used only when chroloquine failed to treat a febrile illness. This pattern of treatment was common both for children, adults and pregnant women.

There was little awareness on malaria prevention in pregnancy. Few participants (4 out of 10 FGDs) said that Fansidar was useful in protecting pregnant women from malaria and they knew that three tablets of Fansidar was the appropriate dose. Some of these participants had visited health units and been given Fansidar; and they were aware that it is useful for malaria prevention.

Perceptions on use of SP for treatment and prevention of malaria in pregnancy ware explored. From the findings all the participants (in all FGDs including adolescents), spontaneously said that SP was an effective drug which could cure malaria. Few participants (especially women) were aware of the benefits of using SP for malaria prevention in pregnancy. Some of these participants had used SP and had experienced no problems with it. These participants thought that SP was effective and could help pregnant women who get malaria. However there was limited awareness by these participants on the timing of the first and second doses of SP in pregnancy. Very few women knew that SP was supposed to be taken at four and seven months of pregnancy. The following expressions illustrate the perceived benefits of using SP in pregnancy.

> I went to the health unit during my previous pregnancy; I was given Fansidar pills and they did not have any effect on me. It is health workers who know what is good for us, if they think Fansidar is good I have no problem (a pregnant woman aged 25 years at Nyenga).
>
> I think Fansidar is very effective because if a person takes it he/she takes months without getting malaria. I recommend it (a woman aged 35 years at Ngogwe who had previously used Fansidar).

3.4. Perceived barriers to the use of SP in pregnancy

In all the FGDs conducted and most of the KIIs, SP was perceived as a strong drug for people who use it; more so during pregnancy and among children. This was based partly on people's experiences and partly on information from health workers that SP is a strong drug. It was narrated how Fansidar weakens people and it can take as long as three days while a person is not feeling well, and one may think he/she still has malaria. Participants had correct knowledge of the dose of SP for treatment of malaria in adults (a single dose of three tablets) but did not know the appropriate doses for children. This area was further explored to find out whether the experience with SP could be attributed to overdose of SP. We found that people were sure that with the right dose of SP they experienced these effects.

Most of the participants in all FGDs believed that because of its strength, SP may cause abortion and this added to the fear of using this drug in pregnancy. One male participant aged 20 years at Mukono trading centre said that he had heard that SP may lead to abortion like chloroquine, and reasoned that if drugs like chloroquine could disturb the foetus how about SP that is stronger. The fear of SP causing abortion was expressed in all the 10 FGDs conducted. There was a difference in perception on this issue among the KIIs conducted. Respondents thought that fear of SP is based on ignorance and non-use of health services by most pregnant women where they could receive proper explanation on how SP works and its benefits. The perception that SP is a strong drug is illustrated in the expression below.

> Most pregnant women fear using Fansidar because when they are pregnant they consider themselves already weak. They fear that since it is strong, it may cause weakness, abortion and lead to abnormal children (a pregnant woman 29 years at Ngogwe).

Most information on use of Fansidar for malaria in pregnancy is obtained from health units and the radio. It was evident that people who had previously used SP were also a source of information about its perceived strength. However, the belief that SP is a strong drug originates mainly from health workers who tell clients that when they take SP they should take a lot of fluids (passionfruit and orange juice mixed with sugar) to help them withstand the strength of Fansidar. Information from the radio emphasised that Fansidar was useful for malaria prevention in pregnancy. However most FGD participants and KIIs respondents said that it was a long time since they heard this information.

During discussions in two of the FGDs the fear of drug resistance was expressed. The use of SP in combination with other weaker drugs was associated with drug resistance. Participants (in 6 of 10 FGDs conducted) thought that use of SP would lead to parasite resistance when drugs, such as chloroquine (considered a weak drug) are used in combination. Drug resistance was understood in the context that once the body gets used to SP, no other drug could ever treat malaria. The fear of drug resistance is summarized in the expression below.

Fansidar is a very strong drug and when malaria parasites get used to it, the weaker medicines like chloroquine may not work on malaria. So, I advise that it is better to take simple medicine first (male participant aged 31 years at Ngogwe).

In our analysis, people preferred first to use drugs considered weak and if these fail then resort to drugs considered strong. In this way they would avoid drug resistance to malaria.

Chloroquine was also widely known as an effective drug to treat malaria among pregnant women and children, although some participants were concerned that it was no longer effective against malaria. Very few participants (in 2 out 10 FGDs), similarly expressed fears that when chloroquine is used in pregnancy especially in high doses, it leads to abortion (see Table 1). This fear is expressed below.

We are aware that a pregnant woman is not supposed to take too much Chloroquine because it leads to abortions (a pregnant woman aged 31 years at Najjembe).

We explored whether other drugs were associated with this perceived strength. Quinine was identified as another drug perceived to be strong for pregnant women and children. This perceived strength was associated with its ability to cure malaria quickly. There were only few respondents with experience from taking quinine as quinine is not widely used in this community.

Table 1
Drugs feared/not feared for use in pregnancy among rural women in Mukono district

Reasons for fearing some drugs	
Fansidar	Weakens people and causes abnormal children
Contraceptive pills	May cause abortion and abnormal children
Quinine	Weakens people and may cause abortion
Aspirin	May cause stomach ulcers
Injectable drugs	Fear of pain caused by injection pricking
	Fear of spread of HIV by contaminated needles
Drugs not feared	
Iron	Smells badly and cumbersome to take on a daily basis
Folic acid	No known fear
Panadol (Paracetamol)	No known fear
Traditional herbs	No known fear
Antibiotic capsules	No known fear

In the discussions with participants (in 5 out of 10 FGDs) their experience with the use of other drugs was expressed. For example, they understood and categorized drugs that are strong and those that are weak. They also understood strong drugs as those, which have strength to cure diseases quickly, and weak ones as those, which cure diseases more slowly. It seems that the perception of the strength of a drug was routed in the context of its ability to cure diseases quickly and the side-effect of feeling weak after use of a drug.

3.5. Perceived barriers related to access of SP

One of the barriers related to access of SP was the information from health workers who advise patients to drink more fluids when they take SP. This advice was found to have cost implications because passionfruit, oranges and sugar cost money. In addition, participants mentioned that SP is itself expensive. Participants compared treating malaria with chloroquine and SP and said that SP is very expensive (costs between 1500 and 3000 Uganda shillings approximately US$ 2) compared to

Chloroquine, which is (300 = Uganda shillings approximately US$ 0.20) with no need of taking extra fluids. Our analysis shows that the perception on costs is an important factor limiting access to SP. The expressions below summarises the cost implications.

Health workers tell us to take a lot of passionfruit juice when they give us Fansidar. They say that Fansidar is strong and requires one to drink a lot. Most people do not have money to buy oranges, passionfruit and sugar, so they drink water which doe not help them much (an adolescent ages 17 years at Buikwe).

Fansidar itself is also expensive; most people cannot afford buying it. I prefer buying Chloroquine which is 300 = Uganda shillings (US$ 20 cents) and I do not have to drink a lot of fluids (a woman aged 35 years at Kimenyedde).

In this study ANC seeking practices were explored as SP for IPT is given thorough ANC clinics. Attending ANC is locally known as *okunywa eddagala* which means to "drink medicines". The local term originated from an old cultural practice of using herbs in pregnancy. These herbs are known as *eddagala eganda* which translates to indigenous drugs. The local term *eddagala* is non-specific and refers to any drug including both modern and traditional medicine. With the introduction of modern health care in Uganda, there used to be regular provision of iron and folic acid pills to pregnant women attending ANC. This long experience of receiving drugs as part of ANC has shaped people's views on the quality of ANC services. The perception that ANC is used only to receive drugs limits access to other services especially information and malaria prevention.

The local term *okunywa eddagla* is also used by health workers when pregnant women go for ANC services. One pregnant woman aged 20 years who is a member of a village council in Buikwe sub-county explained how health workers use the term *okunywa eddagala* when they interact with pregnant women.

Pregnant women wait and go to health units only when they fall sick and thus go to health units to get medicines for treatment and the maternity card. Because when it comes to delivering, some women are asked where they were taking medicines, and if they were not attending ANC, then they may be abused and sometimes chased away.

Participants (in 7 out of 10 FGDs) explained that women go to health units when the pregnancy is advanced (about seven months gestation) mainly because their husbands do not give them money for transport. The husbands perceive their wives as healthy, eating food and see no reason to waste money sending them to health units. They thus miss out on the information about prevention and treatment of malaria during pregnancy. However some pregnant women go to health units to get treatment for malaria and syphilis; while others go to get drugs to strengthen their blood, tetanus injection and deworming drugs. Information from KIIs indicated that most women do not go to health units for ANC mainly due to ignorance and wide use of herbs in pregnancy and the strong perception that these drugs are effective.

The quality of ANC at health units was assessed from the community perspective. It was reported that often there are no drugs at health units and this is one of the reasons why pregnant women do not go to health units for ANC. The issue of unavailability of drugs at health units seems to be an important factor in determining attendance to ANC in this community.

If there are no drugs at the health units, then you get a prescription to go and buy drugs from the shops. If you go to health units and there are no drugs, then there is no proper care (a 22-year-old pregnant woman at Nyenga).

Pregnant women in this community did not perceive going to health units for routine check up as beneficial especially where the health workers had to press their wombs as part of ANC without giving them any drugs. The expression below is from a woman who attended ANC where the midwife examined her pregnancy to check the status of the foetus but she did not get any drugs.

You cannot go to a health unit for only pressing the abdomen without getting drugs; you had rather wait until when you are about to deliver (a female participant aged 36 years at Ngogwe).

The poor ANC attendance was considered by most participants in all the FGDs and most key informants as an important factor that limits access to use of SP in pregnancy. It was mentioned that this poor health seeking leads to missed opportunities for information and services for treatment and prevention of malaria in pregnancy.

The negative attitude of health workers were mentioned in 7 out of 10 FGDs and all KIIs. Most participants and key informants said that health workers

especially midwives were rude to pregnant women who go to deliver at health units but had not gone there before to attend ANC. It was narrated that the midwives could abuse and sometimes beat such pregnant women. This attitude was found to be prohibitive to pregnant women for use of services at health units.

Long distances to health units are also a hindrance to accessing ANC services. One participant commented on the distance as follows.

The distance to the health unit is long and it is difficult for a pregnant woman to walk 5 km to a health unit and yet the common mode of transport is the bicycle (a 37-year-old non-pregnant woman at Ngogwe).

The pattern of resort for treating malaria in pregnancy was assessed as an important aspect determining access to care at health units. It was found that most pregnant women first resort to self-treatment with herbs either alone or in combination with tablets purchased over the counter from drug shops and ordinary shops. When self-treatment fails and symptoms of the disease persist, pregnant women resort to seeking care from health units. The expressions below illustrate the pattern of resort for seeking care for malaria in pregnancy.

When a pregnant woman does not get cured of malaria after using herbs she goes to the clinic if she has the money; but if she does not have the money, then she has no option except to continue using herbs (a non-pregnant woman aged 22 years at Kimenyedde).

A key informant at Buikwe who is a member of the village council said.

Most people with malaria use Chloroquine, Paracetamol and sometimes they also use herbs. They wait to see if there is an improvement of the disease. Most people improve and the few who do not then go to health units (a male aged 35 years at Buikwe).

This pattern of resort for treating malaria in pregnancy highlighted in this study prohibits seeking care from health units and limits access to ANC where malaria prevention and treatment services are delivered. The resort to self-treatment by pregnant women was also considered an important factor that limits access to use of SP in this community.

4. Discussion

The findings of this study show that SP is widely known in the community as an effective drug that cures malaria. However the benefits of SP for prevention of malaria in pregnancy are not widely known. The effectiveness of SP to cure malaria is associated with perceived strength believed to weaken pregnant women, cause abortions and abnormalities to the foetus. Furthermore, there was a belief that use of SP may lead to problems in treating malaria with simple drugs like chloroquine. The argument is that since SP is a strong drug, malaria parasites may get used to it, and the weaker drugs like chloroquine may not be effective against the parasites.

It was found that there were cost implications associated with the belief that SP is a strong drug. People are told by health workers that SP needs to be taken with a lot of juice and people are often not able or willing to pay for this extra cost. People believe that once they have taken SP they have to rest for a long time, which again implies less time for income generating activities. All these extra costs are additional to the cost of SP which is itself is expensive. On the positive side, the strength of SP is associated with the ability to cure malaria quickly compared to chloroquine. In this community people seem to be concerned that chloroquine is becoming less effective. This aspect could help in promoting the new antimalaria drug policy which recommends a combination of chloroquine and SP as the first-line treatment for malaria in Uganda [40].

The results of this study compare with findings in Tanzania where SP was perceived to be more effective than quinine but too strong for children. The study also found that all formulations of SP for adults and children were more expensive than chloroquine [41].

In the community local terms were used to refer to care seeking practices. Use of local terms has been widely described previously [34,39] and a variety of local terms exist which influence treatment and prevention for malaria. Whereas it is important for health workers to use local terms understood by pregnant women, some of these local terms infer wrong messages. For example, the term *okunywa edaggala* used by health workers does not deliver the appropriate meaning for ANC. The local understanding of ANC as to drink medicines should be explained to indicate that ANC has a wider scope than just prescribing drugs. Focused messages should explain benefits of ANC packages in terms of preventing problems during pregnancy. The risks to both the mother and the foetus incurred by malaria should be explained and also the

beneficial affects of IPT and other malaria preventive measures, such as the use of ITNs.

Several factors related to quality of care in health units and their influence on acceptance and use of SP were identified. The information given to clients by health providers on SP is partly responsible for the negative perceptions on its use in pregnancy. Although health workers are supposed to be key people in implementing the IPT Policy, the findings of this study imply that there is limited knowledge among health workers on how SP works, its side-effects and how to counsel pregnant women on its use. It seems that women are not aware of the preventive use of SP during pregnancy but only see SP as a drug to treat malaria.

The poor quality of care at health units assessed from a community perspective in this study is consistent with results of an earlier study carried out in Soroti district, in eastern Uganda where midwives were found providing inadequate services in ANC and maternity units due to their inability to adhere to guidelines [42]. The present findings are also consistent with results obtained from studies carried out in Malawi, Uganda and Kenya where poor quality of ANC due to lack of drugs, long waiting hours and lack of privacy at health units contributed to low utilisation of services [43–45]. There is therefore a need to focus on improving the quality of care in health units in order to improve acceptability and accessibility to malaria preventive interventions.

The negative perceptions on SP and chloroquine have an impact on the new malaria treatment policy in Uganda where chloroquine and SP (Fansidar®) are combined as the first-line treatment of clinical malaria. Poor acceptability of Fansidar may lead to poor treatment of malaria in general. The negative perceptions need to be addressed through messages that clearly describe the benefits of SP.

It is a limitation of this study that we were not able to show how perceptions on SP vary with seasons of the year since perceptions could be related to changing prevalence of malaria. We recommend this area for further research. Another area that requires exploration is whether people show concerns when purchasing drugs and what questions they ask. This information could help in designing an information package targeting drug shops where clients would get information on proper drug use.

Using the Health Belief Model [36], several factors that influence the use of SP in pregnancy were identified. The facilitatory factors include the common perception of the seriousness of malaria and its effect on pregnant women, and the perception that SP cures malaria quickly. The inhibitory factors include lack of awareness that malaria can affect pregnant women without showing any symptoms, lack of awareness that SP is beneficial for malaria prevention in pregnancy, the perception that adolescents are not at risk of malaria, the perception that SP is strong and weakens pregnant women and causes abortions and the poor quality of care at health units (inadequate drugs, health workers providing false information).

The policy implications of our findings include bringing together policy makers and program managers in charge of malaria and reproductive health services to develop a health promotion package based on these findings. This strategy will have to address the perceived barriers especially the misconceptions on the effect of SP in pregnancy. Refresher courses need to be provided to health workers on communication and counselling on the use of SP in pregnancy, its benefits and side-effects. Pregnant adolescents will have to be targeted as a special risk group least likely to access health services. The successful implementation of the policy on malaria prevention in pregnancy will depend on improving the quality of care in health units by ensuring that drugs like SP and those for treating common diseases are available.

Acknowledgements

We wish to thank all the respondents who participated in this study. The following people are also thanked; the District Director of Health services Mukono District, The District Nursing Officer, Mr. Steven Kalake and Olivia Kiconco for their support during fieldwork. We also wish to thank the two research assistants Ms. Jolly Nammudu and Ms. Charity Wamala who participated in data collection and transcription. We acknowledge the comments on the draft by Ms. Harriet Birungi working with the Population council, Nairobi–Kenya. This study was collaboration between the Ministry of Health Uganda, and the Danish Bilharzias Laboratory (DBL), Denmark and was funded by The Gates Partnership Fund at the London School of Hygiene and Tropical Medicine, London University and DBL.

References

[1] Brabin BJ. The risks and severity of Malaria in Pregnant women. Applied Field research in Malaria reports. Geneva: WHO; 1991.

[2] Mc Gregor IA, Wilson ME, Bilewicz WZ. Malaria infection of the placenta in The Gambia, West Africa, its incidence and relationship to birth weight and placenta weight. Transactions of the Royal Society of Tropical Medicine and Hygiene 1983;93:529–34.

[3] Brabin BJ. An analysis of malaria in pregnancy in Africa. Bulletin of the World Health Organisation 1983;61:1005–16.

[4] Bloland B, Slutsker L, Steketee RW, Wirima JJ, Heymann DL, Breman JG. Rates and risk factors for mortality during the first two years of life in rural Malawi. American Journal of Tropical Medicine & Hygiene 1996;(Suppl.):82–6.

[5] Slutsker L, Bloland P, Steketee RW, Wirima JJ, Heymann DL, Breman JG. Infant and second year mortality in rural Malawi; causes and descriptive epidemiology. American Journal of Tropical Medicine & Hygiene 1996;(Suppl.):77–81.

[6] Steketee R, Wirima JJ, Hightower AW, Slutsker L, Heyman DL, Breman JG. The effect of malaria and malaria prevention in pregnancy on offspring birth weight, prematurity and intrauterine growth retardation in rural Malawi. American Journal of Tropical Medicine & Hygiene 1996;55(Suppl.):33–41.

[7] WHO. Implementation of the global malaria control strategy—report of a WHO study group on the implementation of the Global action for malaria control 1993–2000. Geneva, Switzerland: World Health. WHO Technical report Series, 839; 1993.

[8] RBM (Roll Back Malaria). Scaling up insecticide-treated netting (ITN) programs in Africa: a strategic framework for coordinated national action. Geneva: RMB, WHO; 2000.

[9] Greenwood BM, Greenwood AM, Snow RW, Byass P, Bennett S, Hatib Njie AB. The effect of Malaria Chemoprophylaxis given by traditional birth attendants on the course and outcome of pregnancy. Transactions of the Royal Society of Tropical Medicine and Hygiene 1989;83:589–94.

[10] Greenwood AM, Armstrong P, Byass P, Snow RW, Greenwood BM. Malaria chemoprophylaxis, birth weight and child survival. Transactions of the Royal Society of Tropical Medicine and Hygiene 1992;86:483–5.

[11] McDermott JM, Heymann DL, Wirima JJ, Macheso AP, Wahal RD, Steketee RW, et al. Efficacy of chemoprophylaxisis in preventing Plasmodium falciparum parasitaemia and placental infection in pregnant women in Malawi. Transactions of the Royal Society of Tropical Medicine and Hygiene 1988;82:520–3.

[12] Garner P, Gulmezoglu AM. Prevention versus treatment for malaria in pregnant women (Cochrane review). The Cochrane Library, Issue 1, Oxford: Update Software; 2001.

[13] Greenwood B. The use of anti-malarial drugs to prevent malaria in the population of malaria-endemic areas. American Journal of Tropical Medicine & Hygiene 2004;70:1–7.

[14] Newman RD, Parise ME, Slutsker L, Nahlen B, Steketee RW. Safety, efficacy and determinants of effectiveness of antimalarial drugs during pregnancy: implications for prevention programs in plasmodium falciparum-endemic sub-Saharan Africa. Tropical Medicine & Parasitology 2003;6:488–506.

[15] Schulman CE, Dorman EK, Cutts F, Kawuondo K, Bulmar JN, Peshu N, et al. Intermittent sulphadoxine–pyrimethamine to prevent severe anaemia secondary to malaria in pregnancy a randomized controlled placebo. Lancet 1999;353:632–6.

[16] Rogerson S, Chamhika E, Karijala M, Mkundika P, Mhang C, Molyneux M. Intermittent sulphadoxine–pyremethamine in pregnancy: effectiveness against malaria morbidity in Blantyre, Malawi in 1997–99. Transactions of the Royal Society of Tropical Medicine and Hygiene 2000;94:549–53.

[17] Parise ME, Ayisi JG, Nahlen BL, Schultz LZ, Roberts JM, Misore A, et al. Efficacy of sulphadoxine pyremethamine for prevention of placental malaria in an area of Kenya with a high prevalence of malaria and human immune-deficiency virus infection. American Journal of Tropical Medicine & Hygiene 1998;59:813–22.

[18] van Eijk AM, Ayisi JG, ter Kuile FO, Misore A, Otieno JA, Kolczak MS, et al. Human immunodeficiency virus sero-positivity and malaria as risk factors for third-trimester anaemia in asymptomatic pregnant women in western Kenya. American Journal of Tropical Medicine & Hygiene 2001;65:623–30.

[19] Keyantao K, Kodio M, Newman RD, Magia H, Doumatabe D, Ongoiba A, et al. Comparison of intermittent preventive treatment with chemoprophylaxisis for the prevention of malaria during pregnancy in Malawi. Journal of Infectious Diseases 2005:191.

[20] Holtz TH, Kachur SP, Roberts JM, Marum LH, Mkandal C, Chizani N, et al. Use of antenatal care services and intermittent preventive treatment for malaria among pregnant women in Blantyre district Malawi. Tropical Medicine & International Health 2004;9:255–61.

[21] Guyatt HL, Snow RW. Impact of malaria during pregnancy on low birth weight in Sub-Saharan Africa. Clinical Microbiology Review 2004;17:760–9.

[22] Uganda Bureau of Statistics. The Uganda Demographic and Health Survey. Uganda: Uganda Bureau of Statistics Entebbe; 2001.

[23] Schultz L, Steketee R, Chitsulo L, Macehheso A, Nyasulu Y, Ettling M. Malaria and childbearing women in Malawi: knowledge, attitudes and practices. Tropical Medical Parasitology 1994;45:65–9.

[24] Helitzer-Allen DL, Maceso A, Wirima J, Kendall C. Testing strategies to increase chloroquine chemoprophylaxisis during pregnancy I Malawi. Acta Tropica 1994;58(3–4):255–66.

[25] Mnyika KS, Kabalimu TK, Lugoe WL. Perception and utilisation of malaria prophylaxis among pregnant women in Dar es Salaam, Tanzania. East African Medical Journal 1995;72(7):431–5.

[26] Phillip-Howard PA, Steffen R, Kerr L, Vanhauwere B, Schildnecht J, Fuchs E, et al. Safety of mefloquine and other antimalarials agents in the first trimester of pregnancy. Journal of Travel Medicine 1998;5(3):121–6.

[27] Phillip-Howard PA, Wood D. The safety of antimalaria drugs in pregnancy. Drug Safety 1996;14(3):131–45.

[28] Van der Geest S. Self care and the informal sale of drugs in South Cameroon. Social Sciences and Medicine 1987;25(3):293–305.

[29] Van der Geest S, White SR. The context of medicines in developing countries: studies in pharmaceutical anthropology.

Dordrecht/Boston/London: Kluwer Academic Publishers; 1988. p. 131–147.
[30] Adome RO, Whyte SR. Popular pills, community drug use in Uganda. Amsterdam: Het Sinhuis; 1996.
[31] Magadi MA, Madise NJ, Rodrigues RN. Frequency and timing of antenatal care in Kenya: explaining the variations between women of different communities. Social Sciences and Medicine 2000;51(4):551–61.
[32] Addai I. Determinants of use of maternal-child health services in rural Ghana. Journal Biosocial Science 2000;32(1):1–15.
[33] Heggenhougen HK, Hackenthal V, Vivek P. The behaviour and social aspects of malaria control: an introduction and annotated biography. Special program for Research & Training in Tropical Diseases (TDR) 2003.
[34] Agyepong IA. Malaria: ethno medical perceptions and practice in an Adange farming community and implications for control. Social Sciences and Medicine 1992;35(2):131–7.
[35] Kengeya JK, Seeley JA, Kajura-Beganja E, Kabunga E, Mubiru E, Sembaja F, et al. Recognition, treatment seeking behaviour and perception of cause of malaria among rural women in Uganda. Acta Tropica 1994;58(3–4):267–73.
[36] Becker MH. The health belief model and personal health behaviour. Health Education Monographs 1974;2:4.
[37] Bennet P, Smith C. Parent's attitude and social influences on childhood vaccination. Health Education Research, Theory and Practice 1992;7:341–8.
[38] Bradley CB, Kegeles SM. The use of diabetics-specific perceived control and health beliefs measures to predict treatment choice and efficacy in feasibility study of continuous subcutaneous insulin infusion pumps. Psychology and Health 1987;1:133–46.
[39] Winch PJ, Makemba AM, Kamazima SR, Lurie M, Lwihura GK, Premji JN, et al. Local terminology for febrile illnesses in Bagamoyo district Tanzania and its impact on the design of a community-based malaria control programme. Social Sciences & Medicine 1996;42(7):1057–67.
[40] Ministry of Health Uganda. The Malaria Control programme Ministry of Health, BOX 7272 Kampala, Uganda; 2002.
[41] Tarimo DS, Minjas JN, Bygbjerg IC. Perceptions of chloroquine and alternative treatments for uncomplicated malaria in children in a holo-endemic area of Tanzania: implications for the change of treatment policy. Tropical Medicine and International Health 2001;6(12):992–7.
[42] Kaye D. Quality of midwifery care in Soroti district, Uganda. East African Medical Journal 2000;77(10):558–61.
[43] Lule GS, Tugumisirize J, Ndekha M. Quality of care and effects on utilisation of maternity services at health centre level. East African Medical Journal 2000;77(5):250–5.
[44] Ndyomugyenyi R, Neema S, Magnussen P. The use formal and informal services for Antenatal care and malaria treatment in rural Uganda. Health Policy and Planning 1999;13:94–104.
[45] Mwanaki PK, Kabiru EW, Mbuga GG. Utilisation of antenatal and maternity services by mothers seeking child welfare in Mbere district, Eastern Province, Kenya. East African Medical Journal 2002;79(4):184–7.
[46] Taylor WR, White NJ. Antimalarial drug toxicity: a review. Drug Safety 2004;27(1):25–61.