

Opinion Article

Traditional Approach in the Treatment of Malaria in Africa

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“Is it reasonable today, when safe and efficacious medicines like Artemisinin based combination therapies (ACT) are accessible, to use traditional medicines for the treatment of malaria?”

For WHO (World Health Organization); traditional medicine (TM) can be defined as the knowledge, skills and practices of holistic health care, recognized and accepted for its role in the maintenance of health and the treatment of diseases. It is based on indigenous theories, beliefs and experiences that are handed down from generation to generation. Due to the increasing resistance of malaria parasite, availability and cost of modern medicines, majority of the population (80% according to WHO) in affected countries turn to traditional medicine in their search for treatment. Additionally, TM is accessible, affordable, often part of a wider belief system, and considered integral to everyday life and well-being. However, more needs to be done in terms of policy, safety, efficacy and quality, access, and rational use of TM. Drug discovery from medicinal plants led to the isolation of early drugs such as quinine which is still in use. Artemisinin, an anti-malarial drug, is another breakthrough for successful drug discovery in the treatment and control of malaria. Thus, there is an increased interest and need in search of medicinal plants with anti malarial activity to develop novel drugs in the control of malaria. To support drug discovery in Africa based around traditional herbal remedies for treatment of malaria, effort involves an ambition to bring up African laboratories for *in vitro* and *in vivo* natural product screening, can serve scientists across the continent. Hopes are that over the next few years, at least one viable lead compound might be identified. Traditional medicine is still the first point of healthcare for many people in sub-Saharan Africa, where there has been a long and rich tradition of sourcing treatments from herbs and trees. The utility of traditional medicine in the treatment of malaria is wide, there are not several studies conduct to validate the traditional medicines. For the maximal benefit in the utility of traditional medicinal plants in the treatment of malaria there is an urgent need to validate whether the products have really positive effect to cure and reduce the severity of malaria as claimed by the traditional health practitioner. In order to undertake scientific validation of natural

products for claimed effect, and to give right to the medically qualified physicians in prescribing herbal drugs with knowing the quality and contents of herbal medicine, ethno botanical studies, *in vitro* and *in vivo* studies and clinical evaluations should be conduct.

Ethnobotanical Studies

Ethno botanical studies are significant in revealing locally important plant species especially for the discovery of crude drugs. Right from its beginning, the documentation of traditional knowledge, especially on the medicinal uses of plants, has provided many important drugs of modern day. The challenge in ethno botanical studies is to establish a mutual trust with the community to get the right information on medicinal plants and their use. So, the socio-anthropological studies on habits, level of malaria transmission, language of the ethnical groups must be well known in order to facilitate the good collaboration between the researchers and the community. The sites of data collection should be far from the modern health centre to minimize the influence of modern medicine and the information on plants should be collected from real healers, focus groups,

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persons with familial knowledge or already cured, to avoid confusion in the identification of the plant. For example, in parts of African region two different plants can have the same name in the community but with different activities. There is a problem of preparation of remedies and storage because often, other elements like bones, salt or incantations are added to enhance the activity of the remedies. After the ethno botanical study, Biological efficacy of the plants can be tested. Although TM protocol has been simplified, the preclinical evaluation remains difficult in regard to the number of potential plants used by the traditional healers and herbalists. The choosing of the plant to study among plants selected by the ethno botanical studies is not easy. This is because although some of them contain polyphenol and will give a good antimicrobial activity, they may have poor volatility and their extraction is hard. You can easily spend more than three years to identify the compounds responsible for the activity.

Biological Efficacy Evaluation

To obtain the desired constituents of a plant, there are different techniques of extraction that can be applied. Extract of plants can be obtained by applying the techniques used by most of the traditional healers which is generally water and/or ethanol due to the fact that methanol and other optional solvents can lead to toxicity. After obtaining the desired constituent from medicinal plant, the compound can be tested using *in vitro* and *in vivo* assays. Herbal antimalarials tested by *in vitro* assays are generally based on the measurement of the effect of different compounds on the growth of malaria parasites. In this method, the antimalarial effect of the traditional medicine is generally quantified as inhibition of parasite growth. It is mandatory to define a standard protocol like level of parasitemia, haematocrit and the type of solvent used for extraction with in the laboratory before starting the efficacy test of particular ant malarial compound. Generally, there are two basic types of determining the growth of malaria parasites in *in vitro* assays. In comparing the two methods, the non isotopic method is preferable to the isotopic method as isotopic method utilizes radioactive substances and hence there is a problem with the radioactive substance waste disposal. On top of this the equipments used in isotopic method such as liquid scintillation counters and cell harvester are highly expensive. On the other hand, utility of non isotopic methods such as fluorometric assay is more sensitive, has less costs and use fluorescent plate. The use of rodent *in vivo* models for the assessment of ant malarial efficacy of traditional treatments is justified by the similar genetic, biological and biochemical characteristics in animals and human plasmodia. Murine malaria models allow the identification of biological effects on all the stages of *Plasmodium* life cycle, although care must be taken in the interpretation of *in vivo* results. During this investigation, advantage should be taken to include causal prophylactic and transmission blocking efficacy assessments to the standard *in vivo* testing pipeline, now broadly focused on curative efficacy only. Such

complementary efficacies are highly desirable features of new treatments for malaria control to be developed, because they can add a benefit at the community level, limiting drug resistance development, and contributing to reduce malaria transmission.

Safety Assessment

Safety and efficacy of improved traditional Medicinal plants should be assessed as they are widely used to treat diseases including malaria. The utility of traditional medicine is wide, most traditional medicines are used without having preclinical and clinical information about their safety and efficacy. It is evident that local communities using herbal medicine are at times aware of the toxicity of some of the plants material. A good example is the experiences with Burkinabe's as they have a saying "wanbinbanguema" in their local dialect; more which does mean "take me orally and discover me" for species of plant *Jatropha curcas*. The local name given to this plant is exactly referring to the high toxicity of the plant. As some of the traditional medicinal plants used to treat malaria are toxic to humans, evaluation of safety is so crucial. Traditional medicinal plants have developed with in different culture in different regions. So, there has been no parallel development of standards and methods either national or international for evaluating them. The reasons for the lack of research data are due not only to health care policies, but also to a lack of adequate or accepted research methodology for evaluating traditional medicine. It should also be noted that there are published and unpublished data on research in traditional medicine in various countries, but further research in safety and efficacy should be promoted, and the quality of the research should also be improved.

Conclusion

To conclude, it is necessary to create a relationship of trust among users, the prescribers of traditional treatments and holders of scientific knowledge (whether chemical, pharmacological or toxicological). A relationship of trust is required to achieve any fruitful collaboration and condition to generate progress in traditional medicine with all the guarantees in quality and safety.