# Confirmation of malaria parasitaemia and management of postoperative pyrexia

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**Abstract**

**Background:** Patients who undergo surgical operations sometimes develop fever in the post-operative period. Full examination of the patient is essential to detect any obvious pathology. Often, Malaria is considered as a possible cause.
**Method:** Seventy consecutive patients who had operations under general anesthesia were studied. Each had blood examination for malaria parasites pre-operative and post-operative. Pyrexia was fully investigated, including laboratory investigation for Malaria parasitaemia.
**Results:** Thirty patients developed fever in the post-operative period; in 11 of them had malaria parasites were detected in the blood and responded to anti-malaria drugs. Of the other 19, no surgically related cause of the fever could be found in 10 and these were empirically treated for malaria; 6 had good response. Six other patients had positive post-operative malaria parasitaemia but had no fever, demonstrating the endemicity of malaria.
**Conclusion:** There is benefit in the use of anti-malaria drugs in fever where there is no obvious pathology, even when laboratory confirmation of malaria parasitaemia cannot be done.

**Key words:** Malaria parasitaemia, postoperative pyrexia

## Introduction

Fever in the immediate post-operative period is associated with significant morbidity and may be a source of concern to both patient and doctor. [1] The causes can be classified into infective and non-infective. [2] Examples of the latter include atelectasis and metabolic response to trauma. Malaria is an established cause of fever in the general population in areas of endemicity and therefore plays a prominent role in the pathogenesis of post-operative fever.

Malaria is endemic in the West African subcontinent. Persons living in this area develop immunity from harbouring low-level parasitaemia, which may not be detected in blood smear examination. [3] It has been established that some circumstances could convert this sub clinical state to manifestation of

malaria.[3,5] When a patient in the malaria endemic zone has fever unexplained by obvious physical pathology, the possibility that it could be due to malaria should be highly considered. This could be the case of malaria in the post-operative period, but it is essential to establish significant presence of malaria parasites in the blood smear from such patients. Some clinicians who do not have access to adequate laboratory facilities often empirically treat for malaria in these circumstances. This study aims at establishing the relevance of malaria parasitaemia and malaria in fever occurring in the post-operative period. This will contribute to more precise management of post-operative pyrexia.

## Materials and method

Seventy consecutive patients admitted into the University of Benin Teaching Hospital, Benin City under the participating Consultants for surgical operations were considered for the study. A protocol was made to ensure uniform data collection which included name of patient, age, sex, the primary diagnosis and duration of the illness; if there had been any fever, the cause and treatment offered. Blood was obtained for Malaria parasites at the time of obtaining blood for pre-operative haemogram estimation.

Operation was classified into Elective and Emergency. The operative procedure, the type of anaesthesia and duration, and recovery time were noted. During the postoperative period, the patient was monitored for clinical progress, especially fever. Blood was taken from all patients on the second postoperative day for repeat examination for malaria parasitaemia. The blood samples taken for examination for malaria parasites were promptly delivered and blood smear prepared. The detection of two or more stages of parasites, particularly the segmentation form, in the blood was regarded as significant parasitaemia. If fever was observed the time of onset was noted and duration was monitored. The patient was clinically evaluated to explain any obvious cause. Any diagnosed cause was appropriately treated. Anti malaria drugs were used for cases in which blood investigation revealed presence of malaria parasites. When the cause of fever was not certain, and malaria parasites could not be detected in blood examination, anti-malaria drugs were administered empirically. There was no facility for isolation of Virus in the blood.

## Results

There were 70 patients studied, 41 were males and 29 females. The age range was 1 - 75 years (mean 28 years). There were 52 elective cases and 18 emergency operations. The general findings as regards postoperative malaria parasitaemia are shown in Table 1. There were 30 cases who had postoperative pyrexia. Blood smear showed significant malaria parasites in 11, and the patients were treated with antimalaria drugs with good clinical response. The other 19 patients were further clinically evaluated; no obvious clinical cause was found in 10 and these were empirically treated with antimalaria drugs; of these, 6 showed good clinical response. There were 17 cases altogether who had malaria parasites detected in blood examination postoperatively, including the 11 who had pyrexia. Six had no fever.

Clinical severity of the patients was graded based on morbidity, magnitude of the operation (including duration of anaesthesia and operative procedure). Thus, more severe cases were those who had major operations, invariably more than 2 hrs. and/or emergency procedure under general anaesthesia. They were 47, or 67.1% of all the patients. Less severe cases were those who had minor operation and elective; there were 23 (32.9%)

Table 2 shows the incidence of fever and malaria parasites blood stream status. Twenty-four patients (51.1%) of the Major cases/emergency procedure had fever, and 12 (25.5%) had positive malaria parasites. These corresponds to 80% of all cases who had fever and 70.6% of cases with positive malaria parasites on blood examination respectively, compared to the less severe cases.

*Table 1: Perioperative malaria parasitaemia*

| Criteria | No | % |
|---|---|---|
| Positive preoperative MP | 5 | 7.1 |
| Positive postoperative MP | 17 | 24.3 |
| Positive postoperative MP and postoperative pyrexia | 11 | 15.7 |
| Positive postoperative MP, but without postoperative pyrexia | 6 | 8.5 |
| Postoperative pyrexia with positive postoperative MP | 30 | 42.8 |
| Positive preoperative MP and positive postoperative MP | 19 | 27 |
| | 1 | 1.4 |

MP = Malaria parasites

*Table 2: Clinical severity and incidence of pyrexia/Positive malaria parasitaemia*

| Type of surgery | No of patients | No. with pyrexia | No. with positive parasitaemia |
|---|---|---|---|
| Major | | | |
| elective (duration more than 2 hrs) | 30 | 18 | 8 |
| emergency under general anaesthesia | 17 | 6 | 4 |
| Minor | | | |
| elective (duration less than 2 hrs) | 23 | 6 | 5 |
| emergency under local anaesthesia | - | - | - |
| Total | 70 | 30 | 17 |

## Discussion

Postoperative pyrexia remains one of the problems in the management of surgical patients. It has been shown that fever in the postoperative period increases hospital and health care cost, ascribed to extra cost of carrying out microbiology test, radiological services, pharmaceutical costs, and extra room costs due to

extended hospital stay. [6]

Seventeen patients (24.3%) had positive parasitaemia postoperatively as opposed to 5 patients (7.1%) that proved positive preoperatively. This shows that surgery affects the degree of malaria parasitaemia. Surgery per se does not induce malaria parasitaemia but it is likely that the stress of surgery facilitates the movement of parasites from the deep tissue to the blood stream.

The stress of surgery and anaesthesia may have lowered the immunity and predisposed to a higher percentage of malaria parasitaemia. Trauma and physical stress, including pregnancy are known factors that precipitate malaria in patients who have occult infection. [4,5,7]

Of the 30 patients with postoperative pyrexia, 11 (37%) tested positive for malaria parasites and responded to antimalaria treatment. This was a confirmation that malaria parasitaemia was the cause of the postoperative pyrexia. A total of 17 patients had positive malaria parasites, including the 11 cases who had fever; thus 64.5% of parasitaemia manifested clinically. Six of them had no fever, demonstrating the fact that malaria parasites can persist in the blood stream without causing any apparent disease in the native population of an endemic area. This phenomenon of acquired resistance resulting from repeated infection is referred to as premonition. [8] Also when obvious pathology could not be found to account for fever and blood film was negative for malaria parasites, empirical treatment with antimalaria drugs produced clinical cure in about 20% of cases

It was found that the longer the duration of surgery, the higher the degree of postoperative parasitaemia. This could be attributed to the greater amount of stress associated with major surgical procedures. This may equally explain the situation with emergency as opposed to elective surgery. Patients in the former category tend to be more ill with greater depression of immunity when compared to patients in the latter category. There is sufficient time for the optimal preparation of patients for elective surgery as opposed to the emergency cases.

This study has shown that malaria is an important cause of postoperative pyrexia in the endemic region. A full clinical evaluation should, however, be carried out to detect surgically related causes of fever in the postoperative period and appropriate treatment given. Our findings have shown that in the management of postoperative pyrexia in an endemic area, it is not wrong to treat all patients empirically for malaria especially when there are no facilities for laboratory confirmation. A substantial amount of money will be saved by reducing the series of non-specific investigations for pyrexia of uncertain origin. No harm is associated with such practice, as Araujo et al [9] have shown that malaria prophylaxis has a beneficial effect and no mortality. In addition, such practice will contribute to the current global malaria strategy [10]

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