"Until our principal objective
Will make control much more effective
And faced with chloroquine resistance
We must depend on more assistance"

"And find a new medicament
To solve our new predicament
A compound that is all event
Is active, cheap, polyvalent."

Leonard Bruce-Chwatt

SUMMARY AND CONCLUSIONS
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This study on malarial parasite, was aimed to find out various aspects of this parasite which is tragically resurgent, globally and locally with power of damaging human health. The aim of the study was to find out various parasitological aspects and its correlation with clinical outcome in our region. Importance of conventional microscopy in diagnosing infection by malarial parasite, its staining characteristics, importance of examination of thick-thin smears, the way of best interpretation, time and frequency of such examination and to know in vivo drug resistance in our region. The other objectives were to find out importance of malarial parasite in causation of various clinical manifestations like severe and complicated malaria, cerebral malaria, anaemia, hypoglycaemia, acute renal failure, jaundice, pregnancy/post partum related malaria and others. Evaluation of the ParaSight F Test, a serodiagnostic method as a diagnostic tool was also an additional objective for this study. Malarial parasites behave differently at various places thus we also aimed to find out epidemiological characteristics and behaviour of malarial parasites in and around Karamsad which mostly includes the rural population.

This study was done at P.S. Medical College and Shree Krishna Hospital Karamsad. The study includes work done between October '94 to November '97. This study includes data of 440 admitted patients, 1052 thick-thin smear examination of fever cases who came to out-patient department. 226 ParaSight F test of 200 fever patients, cultivation of P. falciparum in tissue
culture medium of 10 patients, prevalence of asymptomatic parasitaemia in 229 blood donors and prevalence of malaria in 70 HIV patients.

Out of 440 indoor patients who had malarial parasitic infections, 226 were male and 214 were female (P value >0.05 non significant). The number of admission due to malarial parasitic infection was more in month of September and October and lowest in month of April and May. 39% of the patients were of Anand Taluka while 15% patients were of Petlad Taluka of Kheda District. Patients came from other talukas of Kheda District and also from Baroda and Ahmedabad districts. Patients came all throughout the year meaning malaria being endemic in Kheda region.

62% of 440 admitted patients had falciparum while 38% had vivax malaria. 10.45% of patients were pregnant/post partum patients. Most of the pregnant patients had developed malaria during post-partum period and they were primigravidae (83% of this group). The mortality amongst pregnant/postpartum group was 30%. This was higher than the female group who were non-pregnant.

64 out of 440 admitted patients died. Out of these 64, 62 patients had falciparum malaria while 2 patients had vivax malaria. Various factors which lead death in falciparum malaria were cerebral symptoms and coma (100%), heavy parasitaemia (32.26%), anaemia (48.39%), hypoglycaemia (48.39%), pregnancy and post-partum period (22.58%), renal failure (16.13%), septicaemia and ARDS.
There was statistically significant difference in most of the clinical features of falciparum and vivax malaria. Typical malarial fever, headache, anaemia and hepato-splenomegaly were features in vivax malaria and atypical fever, GI manifestations, unconsciousness, neuropsychiatric manifestations and anaemia were the features in falciparum malaria. Out of these 440 patients, 30 had associated diabetes and 20 had associated tuberculosis.

The diagnosis of malaria by conventional microscopy was very rewarding. Thick smear examination was considered to be very important and by which the species diagnosis could also be made in most cases. The staining results very much depend on the conviction and determination of the technician and quality of stain, pH of buffer and exact timing of the staining procedure. Finger prick blood was better than anticoagulant blood sample, yield of the positive result was better when smear prepared after 2-4 hours of the fever.

In falciparum malaria, the stages most commonly seen were rings and gametocytes while in vivax malaria rings and larger ameboid forms were commonly seen. In thin smear of vivax malaria, schuffner’s dots were seen. In falciparum malaria heavy parasitaemia, multiple rings (more than one) in one RBC, accolé forms and more than one chromatin dots were seen.

15 patients had blood culture positive associated bacterial infections. Most of them were due to gram negative organisms and had poor prognosis.

The most common antimalarial used by clinicians was chloroquine. However quinine was given in almost 35% of admitted patients.
resistance in patients where chloroquine was used as primary drug was in tune of 5%. The exact magnitude may be higher as quinine also had used as a primary drug in seriously ill falciparum cases.

Importance of family history of malaria could be ascertained in many cases. Many patients of malaria had history of stress especially students developed malaria at the time of academic examinations.

There was statistically significant higher mortality in patients having heavy parasitaemia in comparison with scanty. Though degree of parasitaemia correlated well with death and clinical features, patients of scanty parasitaemia also died.

In the non admitted group of fever cases, 305 out of 1052 had positive smears (28.99%). Falciparum and vivax parasites were seen in 50.5% and 49.51% cases. This means that they were in equal proportions. Taking both admitted and non admitted group, the data suggest the preponderance and resurgence of falciparum strain. Vivax malaria cases were detected in month of July and August. In September -October, the falciparum cases were more.

Out of 229 blood donors smear examined, none was found positive. Parasight-F test was found to be a reliable test for falciparum malaria. Out of 200 cases, in one it was found to have false positive result. In 5 cases who were smear negative and had ingested chloroquine, gave positive result by this test. The test remain positive longer than the smear and thus this test has value in antimalarial treated cases. The intensity of colour could be correlated
with degree of parasitaemia. 4 out of 70 HIV positive had positive smear for malarial parasite.

Cultivation of falciparum malaria was attempted on artificial culture media RPMI-1640, the immature schizonts developed at 24 hours, fully mature schizonts developed at 30 hours, and rupturing of schizonts developed at 36 hrs. of incubation. Successful cultivation requires meticulous, technical, care and aseptic precautions. Following conclusions can be drawn out of this study.

[1] Diagnosis of malarial parasites by conventional microscopy is still very rewarding, life saving and helpful to know about drug resistance.

[2] Giemsa staining and slide preparation from malarial parasites should be done from finger prick blood around 2-4 hrs. after fever with best technical expertise.

[3] Parasight-F test is a good alternative test for diagnosis of falciparum malaria.


[5] Falciparum malarial parasites are preponderant in our area and causes severe and complicated malaria with high mortality.

[6] Post-partum period in pregnant women is the time for development of malaria. This is more common in primigravidae. They develop severe and complicated malaria and chance of mortality is also very high.
[7] Cultivation of *P. falciparum* by the method which we adapted gave good results. Mature schizonts develops after 30-40 hrs. of cultivation.