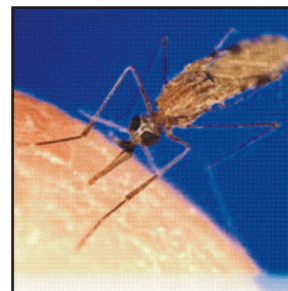


ORIGINAL

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# MALARIA; THE TREND AT TEHSIL HOSPITAL LIAQATPUR



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**ABSTRACT ...** [drarehman100@hotmail.com](mailto:drarehman100@hotmail.com) **Objective:** To study the trend of malaria in this area from 2001 to 2004. **Material and Methods:** It is a longitudinal study. The record of outdoor patients of Tehsil Hospital Liaquatpur and their PCD (Passive Case Detection) slides data from Malaria Control Programme Laboratory at Tehsil Headquarter Hospital Liaquatpur from 2001 to 2004 were collected and analyzed. **Results:** The annual parasite incidence (per 1000) from 2001 to 2004 was 9.8, 5.766, 1.97 and 0.99 respectively. The annual falciparum incidence from 2001 to 2004 was 1.48, 1.27, 0.10 and 0.05 respectively. The slide positivity rate (%) from 2001 to 2004 was 17.11, 9.35, 5.76 and 5.74 respectively while slide falciparum rate (%) from 2001 to 2004 was 2.59, 2.06, 0.297 and 0.307 respectively. Malaria cases were noted throughout the year. **Conclusion:** There is gradual decrease in malaria from 2001 to 2004.

**Key Words** Annual parasite incidence, annual falciparum incidence, slide positivity rate, slide falciparum rate, plasmodium vivax, plasmodium falciparum.

## INTRODUCTION

Malaria is a major public health problem in Pakistan. In the 1990s, the annual number of cases oscillated between 74-112000 of which about 40% were due to Plasmodium falciparum while 104003 in 2001, 101761 in 2002 and 104603 in 2003 malaria cases were reported<sup>1</sup>.

The National targets for the Malaria Control Programme include to reduce the annual incidence to a level less than 0.5-cases/1000 population and to keep the P. falciparum ratio below 40% of all malaria infections in the country<sup>1</sup>.

The malaria incidence varies from year to year. The purpose of this study is to know the trend of malaria in this area.

## MATERIAL & METHODS

This is a longitudinal study. The record of outdoor patients of Tehsil Hospital Liaquatpur and their PCD (Passive Case Detection) slides data from Malaria Control Programme Laboratory at Tehsil Headquarter Hospital Liaquatpur from 2001 to 2004 were collected. The PCD slides were examined by a malaria microscopist who had three month training in the field of malaria slides preparations and microscopy.

The data was analyzed. Annual parasite incidence (the number of malaria positive slides per 1000 population under surveillance), slide positivity rate (number of malaria positive slides per 100 slides examined, expressed as a percentage) and slide falciparum rate (the number of *P. falciparum* positive slides per 100 slides examined, expressed as a percentage) were calculated. Chi square test was used where needed. P value less than 0.05 was taken as significant. Computer software programme "Web Chi Square Calculator" available at URL: [http://www.georgetown.edu/faculty/ballc/webtools/web\\_chi.html](http://www.georgetown.edu/faculty/ballc/webtools/web_chi.html) was used for statistical calculations.

The population drained by this hospital is both urban and rural. The climate of this region is characterized by a long hot dry summer (March-November) with very little rains in July-September and cool/autumn/spring seasons (November-February). This area is mainly agricultural but did not receive any rains in the last four years (2001-2004). The houses are made from mud to bricks. It is a common practice to keep domestic animals in the same house in the rural areas. About 50% people have electricity facilities. The population is stable. No change in the health care system occurred during the studied years. The canal water is used, both for irrigation as well as drinking purposes, collected as ponds, pools and tanks. There is no drainage system in this area resulting in localized wastewater collections. Other sources of drinking water include from open tanks filled by tube wells or hand pumps.

## RESULTS

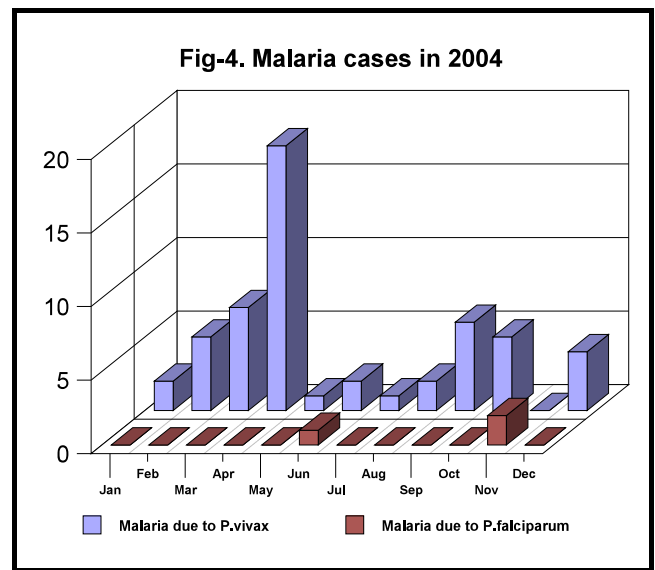
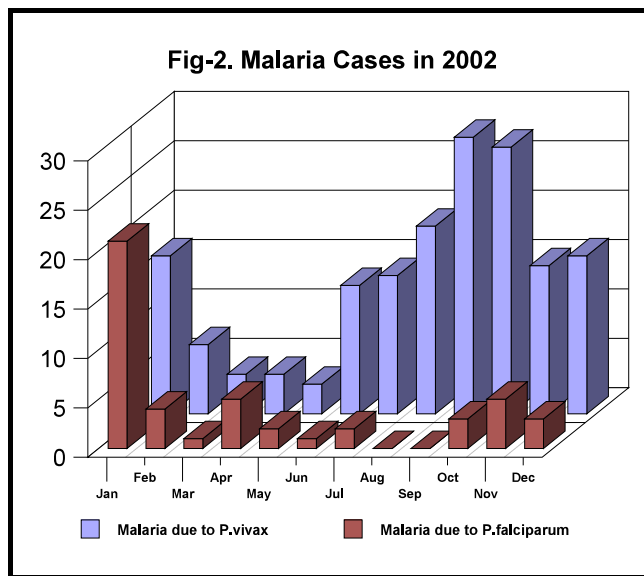
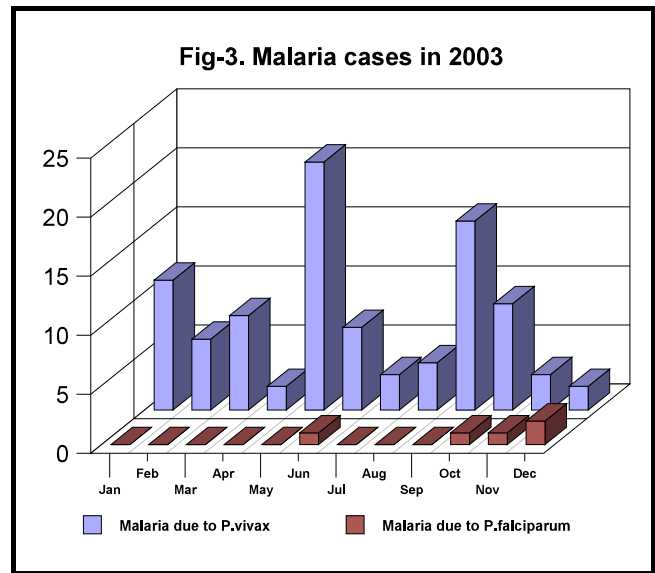
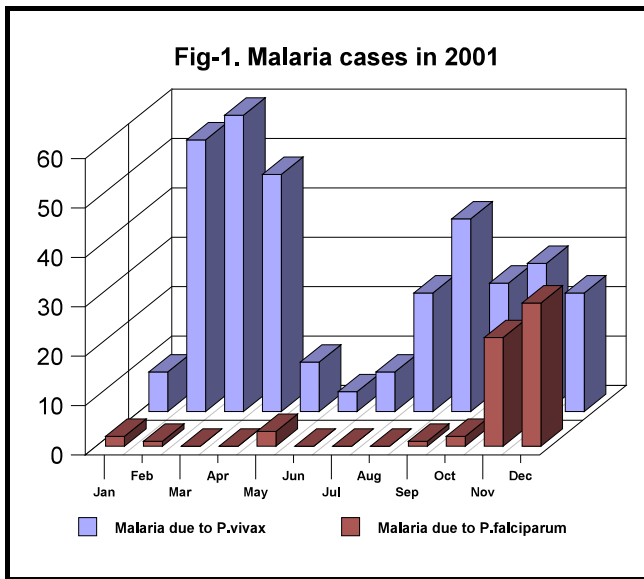
The annual parasite incidence is shown in Table-I, the annual falciparum incidence in Table-II while the slide positivity rate and slide falciparum rate are shown in Table-III.

Year	Total patients	Positive slides for malaria	Annual parasite incidence (per 1000)
2001	40,435	396	9.8
2002	36,943	213	5.76
2003	49,119	97	1.97
2004	56,531	56	0.99

Year	Total patients	Positive slides for falciparum	Annual falciparum incidence (per 1000)
2001	40435	60	1.48
2002	36943	47	1.27
2003	49119	5	0.10
2004	56531	3	0.05

There is statistically significant decrease in the annual parasite incidence ( $p < 0.001$ ) and annual falciparum incidence ( $p < 0.001$ ). Fig-1 to 4 shows month wise total cases of *Plasmodium vivax* and *P. falciparum* reported in this hospital.

Year	Total blood slides examined	Positive slides for malaria	Slide positivity rate (%)	Positive slides for falciparum	Slide falciparum rate (%)
2001	2314	396	17.11	60	2.59
2002	2279	213	9.35	47	2.06
2003	1685	97	5.76	5	0.29
2004	976	56	5.74	3	0.30



**DISCUSSION**

The population-based studies are necessary to know the exact incidence of malaria although the incidence seen in the outpatient clinics was remarkably similar<sup>2</sup>. Moreover it was very difficult to calculate the total cases of malaria in this area as about 20% of patients visited public sector facilities<sup>3</sup>. The annual parasite incidence/1000 patients in 2001 to 2004 was 9.8, 5.766, 1.97 and 0.99 respectively while the annual falciparum incidence/1000 in 2001 to 2004 was 1.48, 1.27, 0.10 and

0.05 respectively in this study. The annual parasite incidence in Pakistan during the year 2003 was 0.8 while the falciparum percentage was 32%<sup>4</sup> and in 1996 annual parasite incidence was 0.751<sup>5</sup>. The annual parasite incidence of India was 1.8 in 2002<sup>6</sup>.

The slide positivity rate (%) in 2001 to 2004 was 17.11, 9.35, 5.76 and 5.74 respectively and the slide falciparum rate (%) was 2.59, 2.06, 0.297 and 0.307 respectively in this study. The parasite rate as well as falciparum rate

varies from year to year, area-to-area and season-to-season. The study done at district Buner in 2001 showed the slide positivity rate 6.86% and slide falciparum rate 1.08%<sup>7</sup>. The slide positivity rate was 11.8% at combined military hospital Zhob during the year 2000-2001<sup>8</sup>. The Malaria Control Programme of Sindh in 1999 to 2001 showed the slide positivity rate 3.1%, 3.3% and 2.7% respectively<sup>9</sup>. The study done in three villages of South Punjab from April 1999 to March 2000 showed the positivity rate of 2.4%<sup>10</sup>. The annual report 1996 of Pakistan showed the slide positivity rate 3.4%<sup>5</sup>.

The fall in malaria in this locality was most probably due to draught season. The weather and conditions favouring for malaria in this area resembled to those in Thar Desert<sup>11</sup>. The drought season caused decreased amount of water supply in the canals in this area which resulted in a fall of the water table, water-holding potential of the soil, decreased growth of vegetation, decreased crops cultivation and decreased collections of water. Theander<sup>12</sup> and Klinkenberg et al<sup>13</sup> noted that malaria cases were rare in the dry season and during droughts.

Malarial cases were seen throughout the year in this study. There was tendency of Plasmodium falciparum to be present in the first and last three months of the year while no case of Falciparum was reported in the month of August in the studied years. The majority of months of 2003 and 2004 remained free from P. falciparum. No constant pattern of malaria was noted but there was late tendency of greater cases of P. falciparum as compared to vivax. The studies done in different areas at different periods in Pakistan showed that cases of Plasmodium falciparum were seen throughout the year with more cases to occur in the second half of the year<sup>2,8,14</sup>. Similar results were reported from certain parts of India and Afghanistan<sup>15,16</sup>. The studies<sup>15,17</sup> showed pattern of the initial increase in P. vivax followed by P. falciparum. The early predominance of P. vivax was believed to be related to the greater ability of P. vivax to produce gametocytemia when conditions became favorable and a lower critical temperature for sporogony<sup>2</sup>. Suppression of P. vivax by P. falciparum had been hypothesized to account for the relative predominance of P. falciparum in


the late season because of its greater virulence in humans<sup>14</sup>. Herrel N<sup>10</sup> reported only Plasmodium vivax in three villages of Punjab.

In brief there is a fall both in total cases of malaria as well as malaria due to Plasmodium falciparum, which were most probably due to drought season.

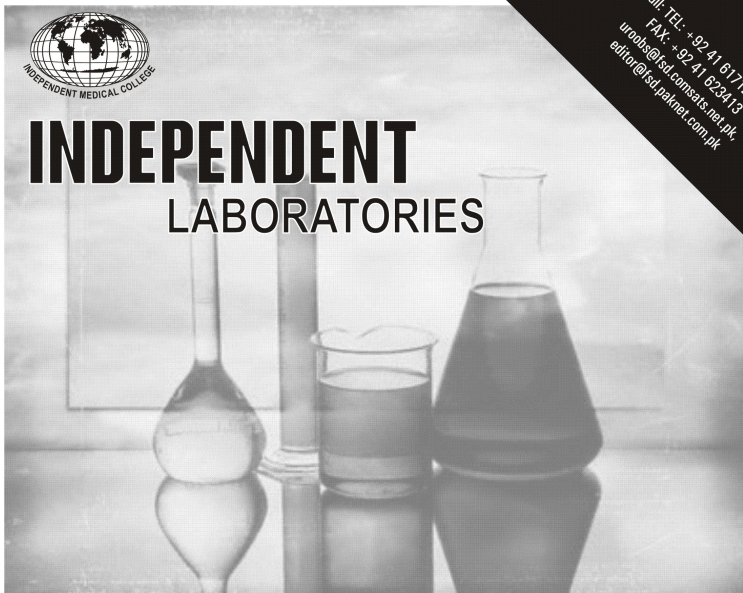
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