

## Epidemiological Finding of Malaria in District Buner Khyber Pakhtunkhwa, Pakistan

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**Abstract:** Current study was conducted in the period of January to December 2013. A total of 4322 samples were collected out of which 192 were positive for malaria. In the total positive samples 134 (69.79%) were male positive and 58 (30.72%) were female. The infection rate was found higher in male population that was 636 (68.90%) as compare to females that was 287 (31.09%). In our study the high cases of malaria was found in the age of 31-40 years 202 (21.88%), followed by 41-50 years 185 (20.04%), 51-60 years 177 (19.17%), 21-30 years 147 (15.92%), 11-20 years 110 (11.91%) and low infection was found in 1-10 years 102 (11.05%). The high collection was done in the month of July 170 (18.41%), followed by June 146 (15.81%), May 120 (13 %), November 110 (11.91%), September 102 (11.05%), August 84 (9.10%), October 72 (7.80%), April 64 (6.93%) and December 55 (5.95%). It was concluded from the present study that the burden of malaria was high in male and malaria was prevalent in the Buner. Protective measurements are required to control the infection.

**Key words:** Malaria • Epidemiology • Prevalence • Buner

### INTRODUCTION

Malaria is one of main causing agent of morbidity and mortality in tropical and subtropical countries, it accounts for 85% of worldwide infectious disease burden. It is a Vector-borne infectious disease caused by a peripheral blood protozoan parasite of the genus Plasmodium [1].

According to World Health Organization (WHO) study, malaria is major killer of mankind, is responsible for 300 to 500 million clinical cases and 1.5 to 2.7 million deaths annually [2].

According to the level of malaria transmission and immunity acquirement, susceptible populations differ in endemic areas. In highly endemic settings, it affects children under five years and pregnant women, constituting the main target population of new malaria control strategies as suggested by the World Health Organization (WHO) [3].

Besides advances in medical sciences, malaria is still a worldwide health challenge causing a death toll of approximately one million annually [4]. More than one billion people live in areas with high malarial risk [5]. According to World Health Organization in 2010, approximately 3.3 billion people were at risk of malaria, although of all geographical regions, populations living

in subSaharan Africa have the highest Risk of acquiring malaria; in 2010 81% of cases and 91% of deaths are estimated to have occurred in the African Region, with children under five years of age and pregnant women being most severely affected [6].

In Eastern Mediterranean Region (EMR), there were 5.7 million confirmed malaria cases, of which 17% cases were registered in Pakistan [7]. In 2010, suspected cases reported from Pakistan were 3, 00000, due to the flood [8]. Malaria is the major causing agent of morbidity in many areas of Pakistan. Major factors involved in the transmission of malaria are the improper diagnosis and control measures [9].

Despite a well-established malaria control program, there are 500,000 malaria infections and 50,000 malaria-attributable deaths occur each year in Pakistan [10], with round about 37% of cases expected to occur in regions along the borders with Afghanistan and Iran [11].

Malaria is caused by five plasmodia; Plasmodium vivax, Plasmodium falciparum, Plasmodium ovale, Plasmodium malariae and Plasmodium knowlesi. P. falciparum is causing agent of about 80% malaria and is responsible for approximately 90% deaths [13]. P. vivax and P. falciparum are most common in Pakistan among the five species of Plasmodium [14].

The increase of drug-resistant parasites malaria, staged a massive comeback in large areas of the world [14]. 95 million of Pakistan's 161 million people, round about 60% of Pakistan's population, live in malaria prevalent regions [15, 16].

Cerebral malaria is major problem in Balochistan Province, Pakistan. [17] observed 505 (31.2%) cases positive for *P. falciparum*, out of 1620 exhausted patients of both sexes aged 1-75 years. in Quetta. Incidence of malaria increased from 22.1% in 1991 to 44.4% in 1995.

The characteristic presentations of *falciparum* at Quetta were observed and recorded 109 (74 males and 35 females) cases positive for *P. falciparum* during May 1996 to November, 1997 with ages between 15-75 years in Quetta [18].

In Nawabshah, out of 435 clinically suspected cases of malaria, 144 patients (33.1%) were confirmed by existence of *P. falciparum* [19]. In 380 cases of cerebral malaria at Children Hospital, Chandkia Medical College, Larkana confirmed 350 cases (92.1%) with *P. falciparum* and 30 cases (7.8%) due to *P. vivax* [20].

In NWFP cerebral malaria was more common in males (64%) and most susceptible group was pregnant women. Out of 2500 suspected cases 10.4% incidence rate of malaria was recorded at Akhunabad, Peshawar [21].

Current study was conducted upon objective to investigate the rate of prevalence of malaria in population of Buner, Khyber Pakhtunkhwa, Pakistan.

## MATERIALS AND METHODS

Current study was focused to evaluate the proportion of tuberculosis in district buner. In this study 4322 patients were investigated in the 6 tehsils of district buner (Daggar, Gadezi, Salarzai, Mandan, Gagra, khudokhel and Chagarzai). A descriptive epidemiological study was conducted in the period of April to December 2013 in order to evaluate the prevalence of malaria in the population of Buner. The data was collected through performa in which whole information was taken from the patients regarding age, sex, address etc. The analysis of the data collected was done age wise, gender wise and month wise.

## RESULTS

**Age Wise Distribution of Data:** In current study total 4322 samples were collected. The age wise distribution of the data was done. The age wise distribution of malaria is shown in Table 3.1.

Table 3.1: Age wise distribution of malarial data

Age	Frequency	Percentage
1-10 year	102	11.05%
11-20 year	110	11.91%
21-30 year	147	15.92%
31-40 year	202	21.88%
41-50 year	185	20.04%
51-60 year	177	19.17%

Table 3.2: sex wise distribution of data

Age	Male	Female
1-10 year	83	30
11-20 year	80	40
21-30 year	112	34
31-40 year	129	66
41-50 year	119	58
51-60 year	113	59
Total	636	287

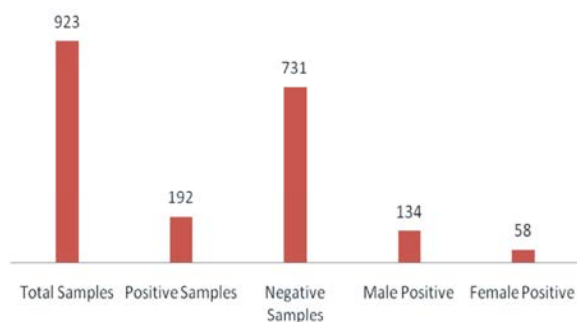
Table 3.3: month wise occurrence of malaria

Month	Frequency	Percentage
January	24	0.70%
February	61	1.78%
March	210	6.13%
April	331	9.67%
May	365	10.66%
June	403	11.77%
July	319	9.32%
August	447	13.06%
September	728	21.27%
October	451	13.17%
November	50	1.46%
December	33	0.96%

**Sex Wise Distribution of Data:** In current study the number of male population was recorded more than females that was 636 (68.90%) and 287 (31.09%) respectively. The sex wise distribution of the data is shown in Table 3.2.

**Month Wise Occurrence of Malaria:** In our study high number of cases were recorded in the month of September 728 (21.27%), followed by October 451 (13.17%), August 447 (13.06%), June 403 (11.77%), May 365 (10.66%), April 331 (9.67%), July 319 (9.32%), March 210 (6.13%), February 61 (1.78%), November 50 (1.46%), December 33 (0.96%) while lowest infection was recorded in month of January 24 (0.70%). The month wise occurrence is shown in Table 3.3.

**Number of Positive Samples and Negative Samples:** Out of total 923 samples 192 (20.90%) were found positive and 731 (79.19%) were found negative. In the positive samples 134 (69.79%) were males and 58 (30.72%) were females. The details are given in graph 3.4.



Graph 3.4: Positive and negative malarial samples

### DISCUSSION

Malaria is somewhat common in Pakistan. Epidemiological data from different regions of Pakistan are unsatisfactory to exactly charge the occurrence of various types of malaria [22]. According to Ansar *et al.* [26] 58% cases were recorded in males and 42% in females in Gadap region Pakistan. According to Junejo *et al.* [27] males were predominant 117(58.5%), while females were 83(41.5%). The male dominance was also reported by Idress, Sarwar and Fareed [28] and Hozhabri *et al.* [29] as that of females in Jhangara. The infection rate in male (7.18%) was found to be high than the female infection rate (6.66%) [30]. In our study the infection rate was higher in males as that of females that was 636 (68.90%) in males and 287 (31.09%) in females.

According to Yasinzai and Kakarsulemankhel [31] there were 88.93% cases of malaria in age 21 years and above. According to Jan and Kiani [32] 73.68% cases of malaria were in age of 21 years and above while the [33] 58.13% cases of malaria in age above 20 years. In India [34] reported the peak incidence of malarial cases in 5-9 years and in Karachi [35], 89% of patients were from 3 months to 10 years. In our study the high cases of malaria was found in the age of 31-40 years 202 (21.88%), followed by 41-50 years 185 (20.04%), 51-60 years 177 (19.17%), 21-30 years 147 (15.92%), 11-20 years 110 (11.91%) and low infection was found in 1-10 years 102 (11.05%).

According to Ahmad *et al.* [24] high cases of malaria were recorded in the month of June 23.38% While the lowest were recorded in the month of January 8.34%. In our study the high cases of malaria were recorded in the month of July 170 (18.41%), while the lowest was recorded in December 55 (5.95%).

According to Khan *et al.* [37] out of total 9864 individuals were checked for malaria, out of these, 1712 (17.35%) were found positive for malaria parasite

including 1567 (91.53%) *P. vivax* and 128 (7.47%) *P. falciparum* and 17 (0.99%) were having mixed infection of both the species. According to Yasinzai and Kakarsulemankhel [38] out of a total of 3765 blood samples 26.8% were found positive for malarial parasite. The quite similar results were found in our study, in total 923 collected 192 (20.80%) were positive. Among the positive samples 134 (69.79%) were found positive in males where as 58 (30.72%) were found positive in females.

### CONCLUSION

From the current study it was concluded that the malaria is common widespread disease in Buner. The male population is more affected than females. High malarial cases were recorded in age 21- 60 years. It is necessary to aware the peoples through media, internet, seminars in order to educate the people. Protective measurement and proper treatment is needed to control the disease.

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