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Incidence of human malaria infection in district Karak

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Abstract

The recent survey got accomplished to figure out the incidence of malaria infection in human population of district Karak. The study was planned in 14 different union councils of district Karak from September 2015 to August 2016. The malarial blood parasites were traced in 3849 suspected patients. Total of 3849 suspected cases of malaria were gleaned-out of 3849 cases 1491 (38.7%) turned positive for malarial parasites-out of total +ve cases 1302 (87.3%) were traced for *P-vivax* and 189 (12.6%) were identified as *P. Falciparum*. This month wise study shows the highest of malaria from July to October. The infection remained higher in males (79.5%). The age based survey reflect the 168 (24%) in age group 1-10, 619 (41.7%) in age group 11-20 and 704 (42.1%) in age group 21-above. There was no single case of *P. vivale* and *P. malariae* was reported. There was found no link b/w malarial infection and age group.

Keywords: Incidence, human malaria infection, accomplished, human population of district Karak

Introduction

Malaria is one of the most inimical disorders globally. In 2002, the clinical cases of malaria reported world-wide were 311 million which lead only about 12% over that by the global burden of disease GDB programmes which were estimated at 273 million [1]. About 660,000 victims died out of 219 million cases of malarial infections recorded-globally in 2010 [2]. Moreover the latent fatality of malaria is taken light & it is socially well known disorder in malaria endemic countries. The misunderstanding of the infection rather than bio-medical consultation or inadequate information regarding its treatment lead to the use of corresponding remedies and avoidance of systematic course of diets [3, 4]. The malarial mortality rate has shown filiations by 25% as suggested by the world malaria report since 2000 [5]. The outcomes of the malarial programmes can be best improved potentially by operational research (OR) [5-7]. On contrary to have elimination of malaria world wide a number of research schemes introduced by the research agenda.

In Pakistan 50,000 deaths occur due to malaria Per-anum out of 500000 infections, provided that malarial programmes are in progress [8, 9]. In NWFP the cerebral malaria was studied and observed by Saleem *et al* (2006) to be more common in males but the most indomitable group was fecundated women [10]. The ecological aspects of cerebral malaria were studied by Duraani *et al* 1997 in Quetta city and observed the mortality rate in patients reporting 64% cases of cerebral malaria in children and 36% in adults [11]. It was investigated by Mahmood (2005) in Karachi and various other localities of Sindh reporting *P-vivax* to be two times more than *P-Falciparum* infection [12].

To evaluate seasonal diversities of presentation model Bhalli and Sami Ullah in quested 120 cases of falciparum at Multan C.M.H. A lofty incidence of the falciparum was marked from August to November among troops [13]. A high incidence of *P-vivax* (62%) than *P-falciparum* (36%) was recorded at the department of pediatrics CMH Multan by Jamal *et al* (2005) [14]. Malaria results from a histo-zoic parasite called plasmodium including four species *P-Falciparum*, *P-vivax*, *P-ovale* and *P-malariae* which are alienated by an infected mosquito bite [15-17]. Malaria is caused when blood is socked from an infected person by a potent

anopheles mosquito. The parasite moves to the mosquito's gut where it passes various stages of life cycle then it moves to salivary glands and thus parasite is inoculated in another person while biting [18]. The *P-vivax* has acquired the increased temperature tolerance range and *P-malariae* has similar adaptation to temperature range but its developmental period inside mosquito is prolonged. The *P-falciparum* needs more temperature than *P-vivax* and *P-malariae* and it can't reproduce below 19 °C [19].

The plasmodium for completion of its life cycle requires both human and mosquito host and thus establish a triad relationship of parasites, human and mosquito. Some researchers find these relationships very complicated but the plasmodia respond the biological and seasonal elves in human host. In tropical regions where the mosquitoes are abundant throughout the year. The gametocyte formation may be induced at the commencement of alienation period by the bite of uninfected mosquitoes [20]. The standard way of malaria prognosis thick and thin Geisnia technique [21]. The aim of the current study was to find out the incidence of human malaria infection in district Karak, KP, Pakistan.

Materials and Methods

This endemic study regarding malarial infection got accomplished in January 2015 to October 2016. The case study was carried out by inspecting various localities of district Karak to trace out the nature of parasite in blood of the patients prognoses with malaria.

Karak is the North-South district of KPK. It is situated at 70.40° to 71.30° at longitudes 32.48° to 33.23° north latitudes. The total area of district Karak is 3372 sq-km. the total population 4, 30,000. The Karak district is located at 600 to 1400 meters above the sea-level. The climate of district Karak

is hot in summer and very cold in winter, it is a semi-arid region [22].

The recent survey was made by adopting two strategies i.e. passive case detection (PCD) and Active case detection (ACD).

In PCD the thick and thin blood smears were prepared by taking out of blood from patients attending general headquarter hospital and civil hospital of district Karak. While in ACD the regular and routine visits were made on weekly basis to 8 various localities with a population more than 9000 after consultation with the heads of that much inspected locality. The prepared slides were then brought back to the laboratory for microscopic view to trace out the malarial parasites using the keys furnished by the chiodni *et al* [23]. The slides were stained with Geisma's technique adopting the keys furnished by Mansoor Bah and Bell in 1987 [24].

Annual Blood Examination Rate (Aber)

It is the proportion of the blood slide under consideration for malaria in human population per anum. This is found out by applying the given formula.

$$ABER = \frac{\text{Number of slides examined per year}}{\text{Total population surveyed}} \times 100$$

Slide Vivax Rate

It involves the proportion of slides traced out for *P-vivax* out of the total examined slides.

$$SVR = \frac{\text{Number of } P. \text{ vs slides}}{\text{Total Examined slides}} \times 100$$

Table 1: area-based infection of malaria

S.NO	Area	Slides Examined	% / No of +VE	% of P.V	% of P.F
1	Karak City	337	123 (36.4)	112 (91.0)	11 (8.9)
2	Sabir abad	272	97 (35.6)	90 (92.7)	7 (7.72)
3	Godi-Khel	362	177 (48.8)	165 (93.2)	12 (6.7)
4	Takht-e-Nasrati	288	102 (35.4)	86 (84.3)	16 (15.6)
5	Ahmad abad	297	109 (36.7)	89 (81.6)	20 (18.3)
6	Jahengeri	112	51 (45.5)	42 (82.3)	9 (17.6)
7	Latamber	242	104 (42.9)	91 (87.5)	13 (12.5)
8	Nari Panos	217	69 (31.7)	58 (84.0)	11 (15.9)
9	Jandri	367	166 (45.2)	152 (91.5)	14 (8.4)
10	Gurguri	369	89 (51.2)	173 (19.5)	16 (8.4)
11	Palosa Sar	292	78 (26.7)	62 (79.4)	16 (20.5)
12	Saraj Khel	213	73 (34.2)	59 (80.8)	14 (19.1)
13	Chokara	186	62 (33.4)	49 (79.0)	13 (20.9)
14	Miaki	295	91 (30.8)	74 (81.3)	17 (18.6)
Total		3849	1491 (38.7)	1302 (87.3)	189 (12.6)

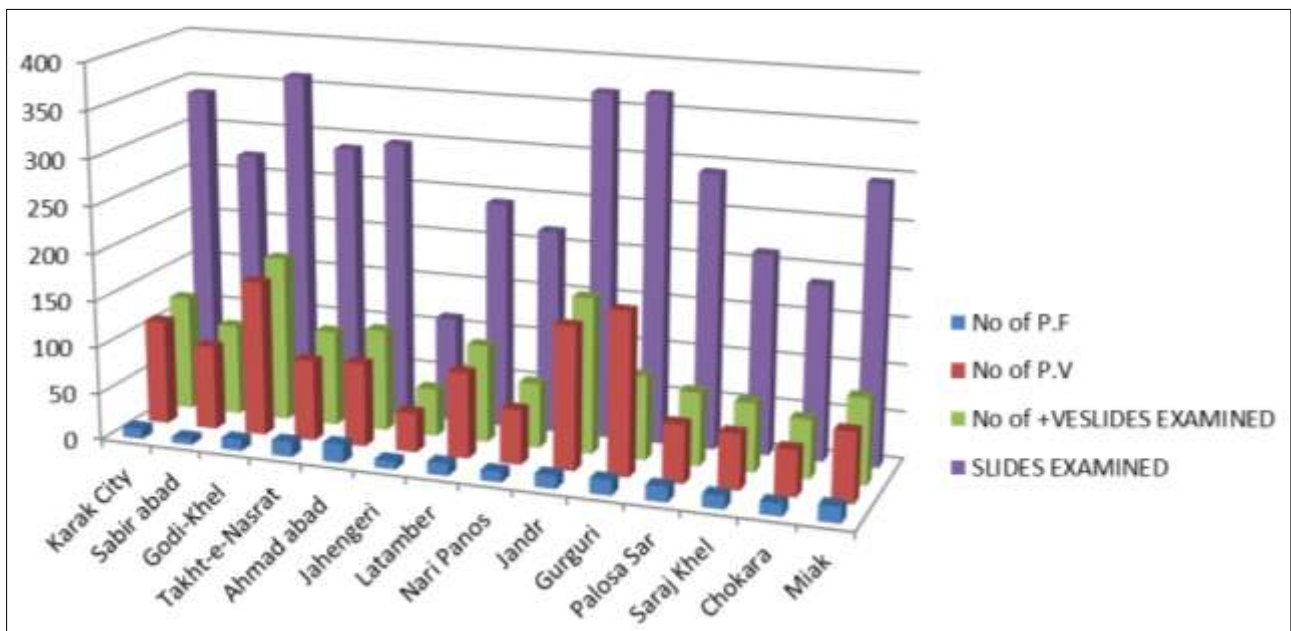


Table 2: Monthly-Based Infection of Malaria

Month	Slides Examined	% Of +Ve	P.V%	P.F%
September	597	189 (31.6)	178(94.2)	11 (5.9)
October	442	172 (38.9)	149 (86.7)	23 (13.4)
November	387	131 (33.8)	117 (89.4)	14 (10.7)
December	309	106 (34.3)	91 (85.9)	15 (14.2)
January	178	92 (51.6)	84 (91.4)	8 (8.7)
February	98	38 (38.7)	27 (71.1)	11 (28.9)
March	127	68 (53.5)	59 (86.8)	9 (13.3)
April	168	77 (45.8)	65 (84.5)	12 (15.6)
May	296	105 (35.4)	97 (92.4)	8 (7.7)
June	338	118 (34.9)	102 (86.5)	16 (13.6)
July	418	193 (46.1)	180 (93.3)	13 (6.8)
August	491	202 (41.1)	193 (95.6)	9 (4.6)
Total	3849	1491 (38.7)	1342 (90.01)	149 (9.90)

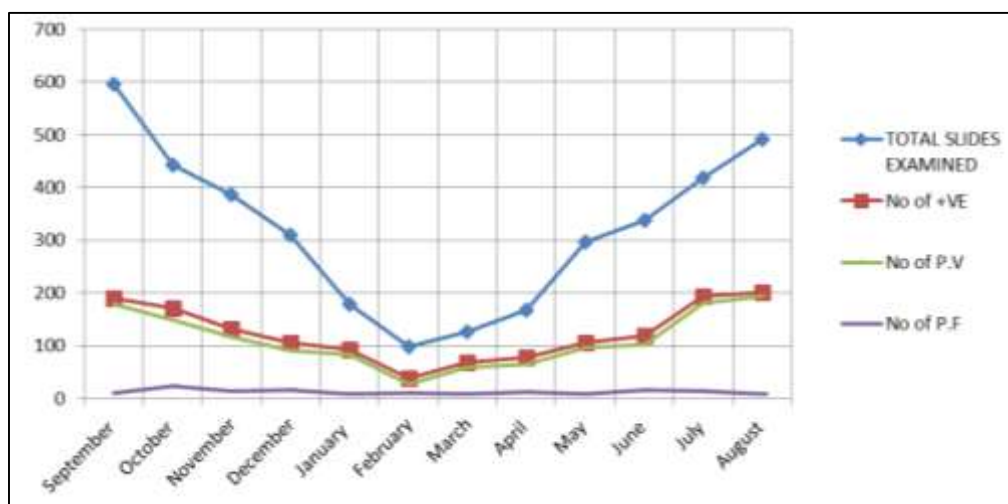


Table 3: Age-Based Infection of Malaria

S.NO	AGE (years)	S. Examined	T. No of +ve	Over-all%	P. v%	P.F%
1	1-10 years	697	168	24.1%	143 (85.1)	25 (14.8)
2	11-20 years	1482	619	41.7%	561 (90.6)	58 (9.3)
3	21-above	1670	704	42.1%	629 (89.3)	75 (10.6)
Total		3849	1491	38.7%	1333 (89.47)	158 (10.5%)

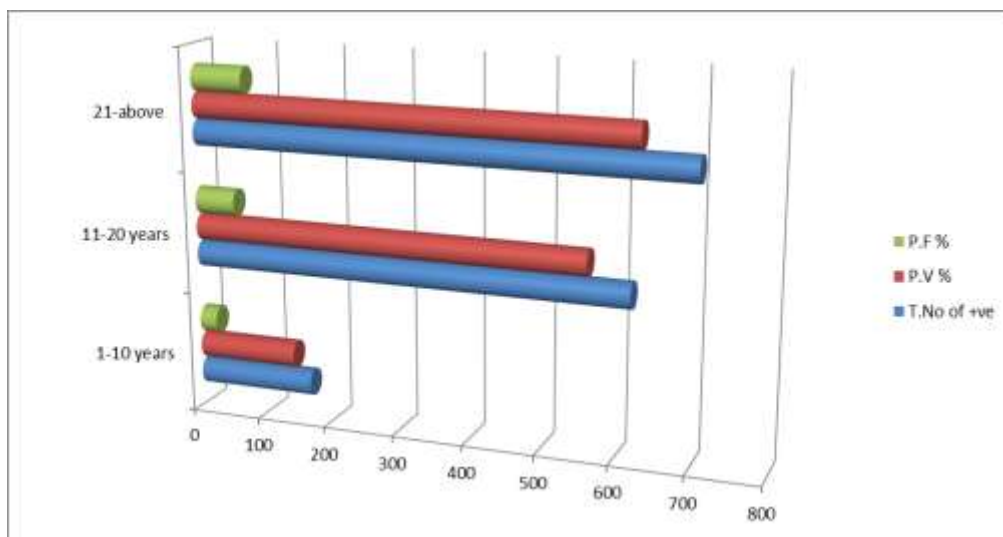


Table 4: Gender-Based Infection of Malaria

No of S. Examined	T. No of +ve	Male +ve No of Male +ve		Female +VE NO Of Female +VE	
		<i>P. vivax</i> No &%	<i>P-falciparum</i> No &%	<i>P-vivax</i> No &%	<i>P-falciparum</i> No &%
3849	1491	1054 (70.6)	132 (8.9)	269 (18.04)	36 (2.4)

Treatment of Malaria

1. Presumptive Treatment:

Number of Chloroquine Tablets (150 mg base)

1-11 months	1/4
12-24 months	1/2
3-4 years	1
5-6 years	2
7-14 years	3
15 + years	4

2. Radical Treatment

a. Falciparum Malaria

C= Chloroquine Tablet (150mg base)

P= Primaquine Tablet (7.5 mg base)

Age Groups

Date of Treatment

1-11 months	C = 1/4	C = 1/8	C = 1/8
12-24 months	C = 1/2	C = 1/4	C = 1/4
3-4 years	C = 1 P = 1/4	C = 1/4 P = 1/4	C = 3/4 P = 1/4
5-6 years	C = 2 P = 1/2	C = 1 - 1/2 P = 1/2	C = 1 - 1/2 P = 1/2
7-14 years	C = 3 P = 1	C = 2 - 1/4 P = 1	C = 2 - 1/4 P = 1
15 + years	C = 4 P = 2	C = 3, P = 2	C = 3 P = 2

b. Vivax Malaria

Day of Treatment

1-11 months	C = 1/4	C = 1/8	C = 1/8
12-24 months	C = 1/2	C = 1/4	C = 1/4
3-4 years	C = 1 P = 1/14	C = 3/4 P = 1/4	C = 3/4, P = 1/4
5-6 years	C = 2 P = 1/2	C = 1 - 1/2, P = 1/2	C = 1 - 1/2, P = 1/2
7-14 years	C = 3 P = 1	C = 2 - 1/4, P = 1	C = 2 - 1/4, P = 1
15 + years	C = 4 P = 2	C = 3, P = 2	C = 3, P = 2

Primaquine must not be given to pregnant woman, or to children below age 2 years.

Discussion

Malaria is an impregnable infection and has caused a great ravage to humanity. Being an endemic belt, one case per thousand populations is claimed by Pakistan. The root cause of global mortality is acute malaria and *P-Falciparum* has a lions share in these deaths [25]. In the developed countries malaria is not a serious issue but in progressing and under-developed states it is a major infection besides rendering un-compostable social and economic burden, it is the major cause of morbidity and mortality. The anti-microbial resistance of *P-Falciparum* to various anti-malarial drugs has been remained problematic in the control and eradication of malaria [26]. The stagnant water provides an ideal breeding habitats for mosquitoes. In consequence of heavy rain-fall in moon-soon the malaria tolls throughout the year but more severe cases are encountered from July to November after rains [27, 28].

The recent malarial case-study was conducted during the year September 2015 to August 2016. The cases were recorded with a special regard to the incidence of *P. vivax* in various localities of district Karak. In the year 2015 a total of 1491 slides were examined microscopically for malaria out of which 1342 (90.01%) *P. vivax* (%) and 149 (9.90%) were *P-*

falciparum. The same high incidence was found in Okara (98%) [29]. Muzafar-abad (90.4%) [30] And in Ziarat (64.7%) [31]. Three age-based groups of malarial victims were considered. The infection recorded in age-group 1-10 years was 168 (24.1%) of which *P. vivax* was 85.1% and *P. falciparum* was 14.8% and the same condition was found in Kashmiri immigrants in Muzafar-abad. The incidence of malaria in age-group 11-20 was surveyed 619(41.7%) and the same was found in district Bolan [32]. The malaria in age-group 21-above reported was 42.1% of which *P. vivax* was 89.3% and *P. falciparum* was 10.6% and the similar incidence was documented by M.I Yasin Zai and J.K Kakar in district Jaffar-abad [33]. the gender-based study of malaria reflects the high incidence of infection in males% than females% and the same incidence was worked out by Ali *et al* 2013 [34] and yar-*et al* 1998 [35] observed the same result.

The month-wise study reveals the prevalence of malaria to be more abundant in months from August to October. The highest numbers of cases were reported in August and November. The same high incidence was found by Jayadev and Viveka vardhani (2013) [36] and also by M.F Yasin Zai and J.K Kakar suleman khel [37]. The cases of *P. vivax* tolls higher than *P-falciparum* in district Karak. The high prevalence of *P. vivax* has also been worked out by Mehrun-Nisa *et al*, (2002) [38] in OPD (Outpatient department) of Jawaharlal medical college, Aligarh during 1998 and 1999 [39] and the same incidence of *P. vivax* was also reported by M.I Yasin and J.K Kakar suleman khel in district Bolan [40].

Conclusion

The month-wise study reveals the prevalence of malaria to be more abundant in months from August to October. The highest numbers of cases were reported in August and November. From the above study it may be concluded that the cases of *P. vivax* tolls higher than *P-falciparum* in district Karak.

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