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THE BORDERING AREAS (NINE AREAS OF PANJGUR DISTRICT) ISSUE OF PAKISTAN ABOUT HUMAN MALARIA PREVALENCE: A CROSS-SECTIONAL RESEARCH OF MALARIA PARASITES IDENTIFICATION IN BLOOD SLIDES

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Abstract:

Objective: *The objective of research was the malaria infection prevalence identification in the population of Southern Western Pakistan (Panjgur).*

Methods: *Our research was by design cross-sectional and it identified the malaria parasites in the suspected patients' blood slides. Total malaria suspected patients were 6119. Research was completed in the time span of July, 2006 to June, 2008 with the help pf active and passive detention methods. Statistical analysis was carried out through SPSS – 11.*

Results: *In total malaria suspects of 6119, we found that 2346 cases (38.3%) were positive for the smear slides of malaria parasite. In the total sample population 1868 cases (79.6%) were because of the infection of Plasmodium vivax and 478 cases (20.3%) were observed with P-Falciparum. However, we also observed a seasonal variation: highest infection was P. vivax as 131 / 144 (90.9%) in the month of November and it was observed low in October as 83 / 176 (47.1%). The males were higher in prevalence as 1831 (78%). In terms of age the prevalence was observed about disease as 334 (81.2%) and 860 (80%) respectively 1 – 10 and 11 – 20 years. We observed no case of P. oval and P. malaria in the time span of research and also there was no relation of age group and infection type.*

Conclusion: *Infection of human malaria was frequently observed in the region of research, area of Baluchistan is one of the hottest areas of Pakistan. Among clinically-suspected malaria cases high positivity rate was observed. P. vivax was highly prevalent and it posed a significant threat to the healthcare; whereas, P. falciparum can also be a serious complication in addition to the cerebral malaria.*

Keywords: *Malaria, ACD, PCD and Panjgur.*

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INTRODUCTION:

Malaria is a risk in the fifty percent world population. In the estimates of 2008, reported cases were 243 million with death of 863000 from this disease. Eastern Mediterranean countries, Plasmodium (P.) falciparum highly prevalent in Djibouti species, Yemen, Saudi Arabia and Sudan including Pakistan and Afghanistan the prevalence was observed about infection of P. vivax including Iraq and Iran as well [1]. Back in 2006, disease of malaria surveillance program noticed a total of 3.5 million slides and malaria confirm cases were 127,825. It was also observed that malaria confirm cases were 0.8 / 1000 in API (Annual Parasite Incidence). However, the estimate showed that the incidence is five times higher when diagnosed in the public sector in the facilitation cover of 20 – 30 percent, rest of the infected patients were cured in the private clinics [2]. Pakistan is estimated an annual malaria incidence of 1.5 million [3].

According to the estimates of 2004, AJK and Punjab were reported low in comparison to the FATA and Baluchistan. KPK and Sindh were moderate in the same time span [4]. Major disease in Baluchistan is cerebral malaria. Khadim states that positive cases were (11.7%) as observed in CMH, Zhob [5]. Malaria control program held in Baluchistan calculated positivity in the slides in 9 districts and observed results year wise; as in 2004, 2005 and 2006 respectively in Lasbella, Qilla Abdullah, Mastung, Khuzdar, Kohlu, Zhob, Kharan, Sibi and Turbat respectively as (5.7, 4.7 and 5.7%), (1.0, 0.5 and 3.8%), (5.3, 6.6 and 17.5%), (1.1, 1.5 and 2.5%), (9.6, 12.9 and 42.2%), (27.2, 32.4 and 42.2%), (13.3, 10.2 and 29.5%), (7.3, 7.5 and 7.68%) and (13.5, 13.5 and12.9%) [6 – 8].

Shaikh is of the view that malaria endemicity in Quetta from Jan, 1994 to Dec, 1998 was smear positive in (34.8%) having P. vivax and P. Falciparum respectively as 66.8% and 30.7% [9]. Farooq suspected 505 malaria cases in his research held in the district of Khuzdar with higher prevalence rate of P. falciparum (69%) in comparison to the P. vivax as (24%) and there were also mixed infection cases as (7%) [10]. Local print media reported higher cases of mortality in the district of Panjgur. Our research is 1st of its kind in the area for the evaluation of the malaria affected cases.

PATIENTS AND METHODS:

Our research was cross-sectional and it commenced from July, 2006 to June, 2008 in nine areas of Panjgur, which is near Baluchistan and Iran border and have a total population of 380,000 [11].
Two methods were used for the malaria detection, passive and active respectively blood films of patients having the signs of fever with shivering and malaria history and local chieftain on those cases who had thick blood films and malaria [12].

Table-1: Area-wise slide positivity rate of malaria infection in Panjgur district

S No	Area	Slides examined		No. of positive cases				*P. vivax*		*P. falciparum*	
				PCD (%)		ACD (%)					
		PCD	ACD	N	%	N	%	PCD	ACD	PCD	ACD
1	Panjgur city	1433	437	544	38	154	35	523	142	21	12
2	Tusp	571	125	227	40	40	32	146	32	81	8
3	Gwargo	607	194	223	37	78	40	163	67	60	11
4	Shahbaz Kalat	366	81	191	52	19	23	158	13	33	6
5	Washup	506	153	176	35	73	48	134	52	42	21
6	Paroom	433	110	145	33	49	45	95	40	50	9
7	Bizban Chah	347	82	147	42	21	26	121	16	26	5
8	Guchak	249	56	97	39	16	29	68	12	29	4
9	Rahi Nagor	321	48	120	37	26	54	70	16	50	10
10	Total	4833	1286	1870	39	476	37	1478 - 79%	390 - 81.9%	392 - 20.9%	86 - 18%

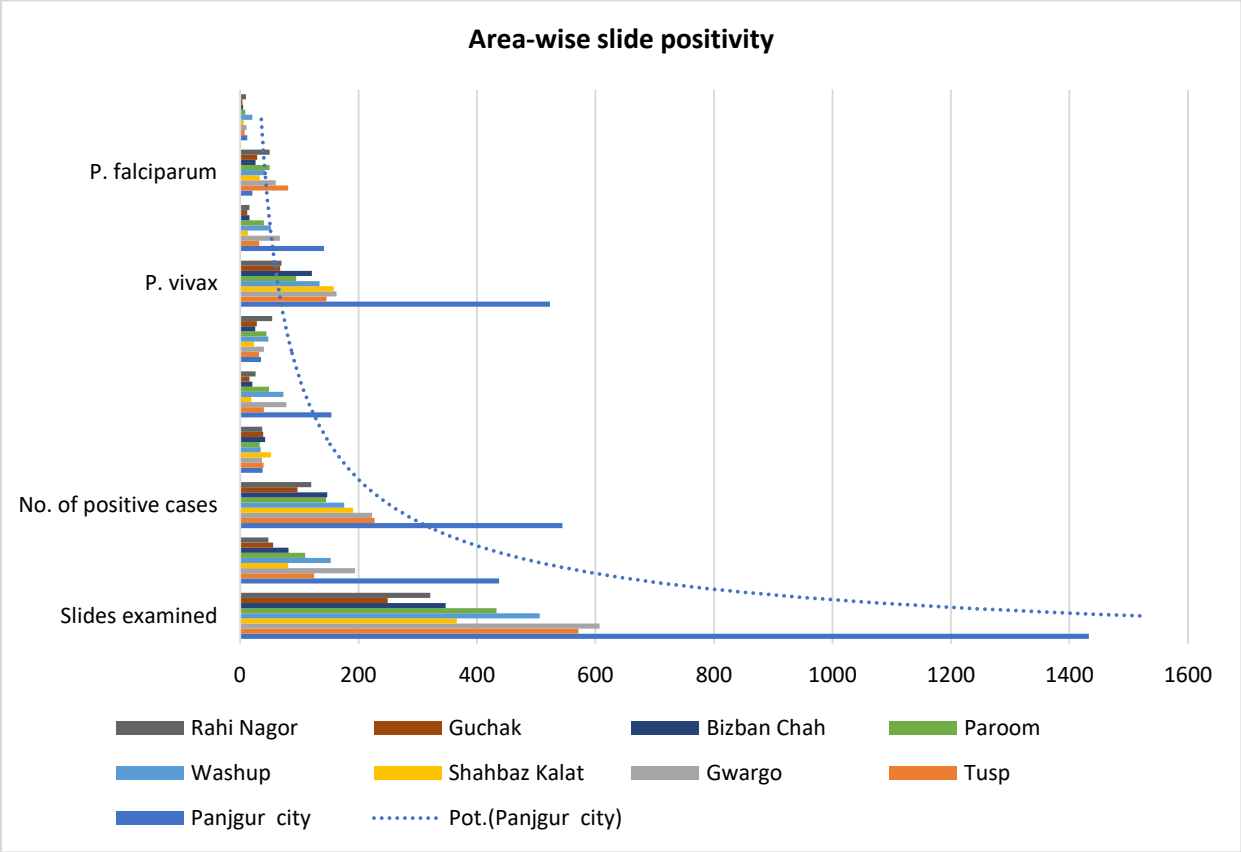
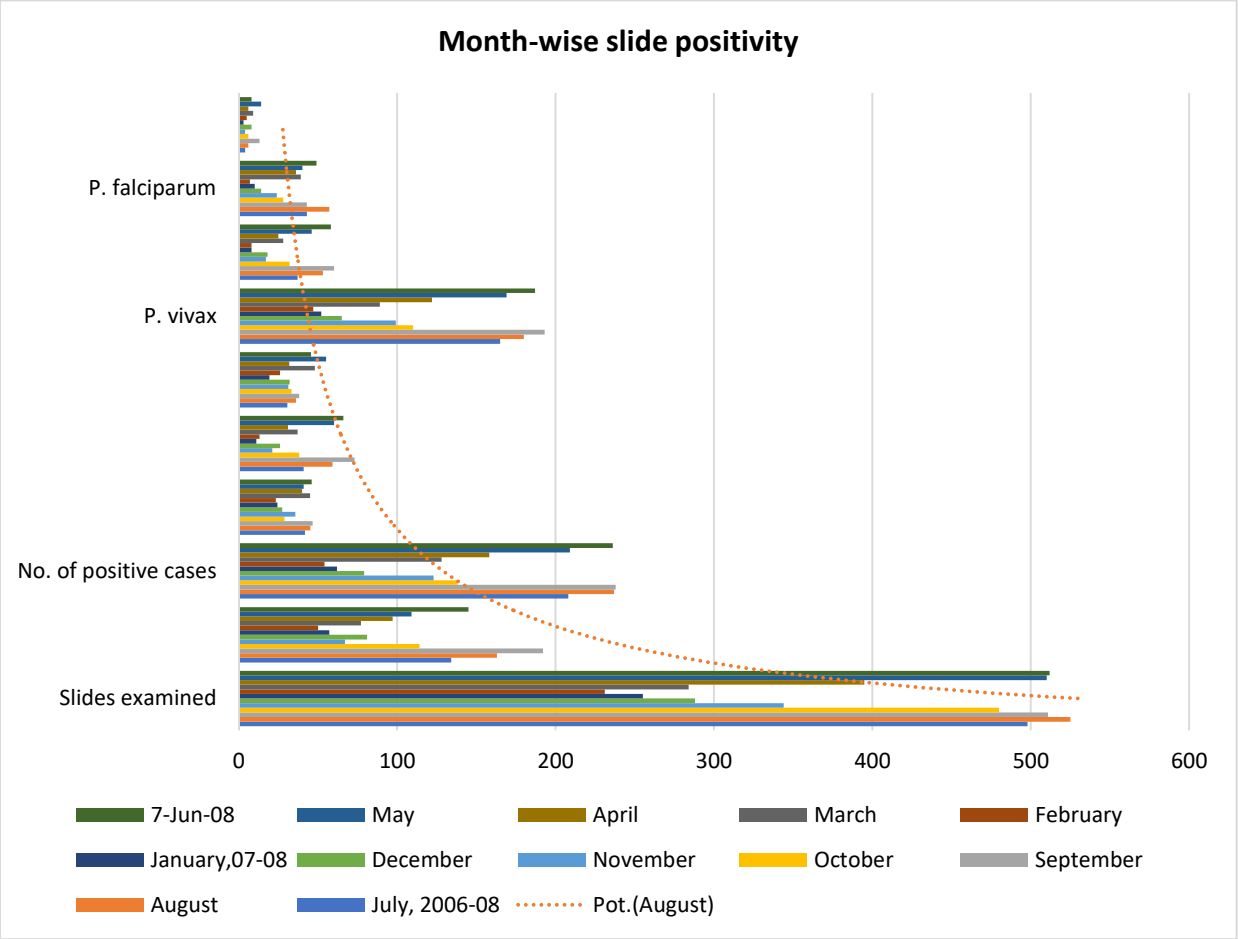


Table-2: Month-wise slide positivity rate

Month	Slides examined		No. of positive cases				*P. vivax*		*P. falciparum*	
			PCD (%)		ACD (%)					
	PCD	ACD	N	%	N	%	PCD	ACD	PCD	ACD
July, 2006 - 08	498	134	208	42	41	31	165	37	43	4
August	525	163	237	45	59	36	180	53	57	6
September	511	192	238	47	73	38	193	60	43	13
October	480	114	138	29	38	33	110	32	28	6
November	344	67	123	36	21	31	99	17	24	4
December	288	81	79	27	26	32	65	18	14	8
January, 07 - 08	255	57	62	24	11	19	52	8	10	3
February	231	50	54	23	13	26	47	8	7	5
March	284	77	128	45	37	48	89	28	39	9
April	395	97	158	40	31	32	122	25	36	6
May	510	109	209	41	60	55	169	46	40	14
7 - Jun – 08	512	145	236	46	66	46	187	58	49	8
Total	4833	1286	1870	39	476	37	1478 - 79%	390 - 81.9%	392 - 20.9%	86 - 18%



Collaboration was made in the ten-health facilitation centers in the twenty-four visits the research was completed in 2 years. We collected slides of blood and stained them through Giemsa staining as per Paniker [12]. Malaria parasites identification was made in the light of Panikar and Chiodini guidelines [12].

SPSS – 11 was used for the data analysis. Percentage and Frequency was used for the data description. We also applied Chi-Square test and association for infection type and age was also made. Significant p-value was taken as (<0.05).

RESULTS:

In the sample of research, the PCD and ACD were respectively 4833 and 1286 included in the three selected groups of age respectively as 1 – 10 years, 11 – 20 years and above twenty years as shown in Table-I. Hygienic condition and environment are the causes of variation.

Table-3: Age-wise slide positivity rate

S No	Age (Years)	Slides examined		No. of positive cases				*P. vivax*		*P. falciparum*	
				PCD (%)		ACD (%)					
		PCD	ACD	N	%	N	%	PCD	ACD	PCD	ACD
1	1 - 10	1052	287	321	31	90	31	253	71	68	19
2	11 - 20	1867	611	839	45	235	38	665	199	174	36
3	21 and Above	1914	388	710	37	151	39	560	120	150	31
4	Total	4833	1286	1870	39	476	37	1478 - 79%	390 - 81.9%	392 - 20.9%	86 - 18%

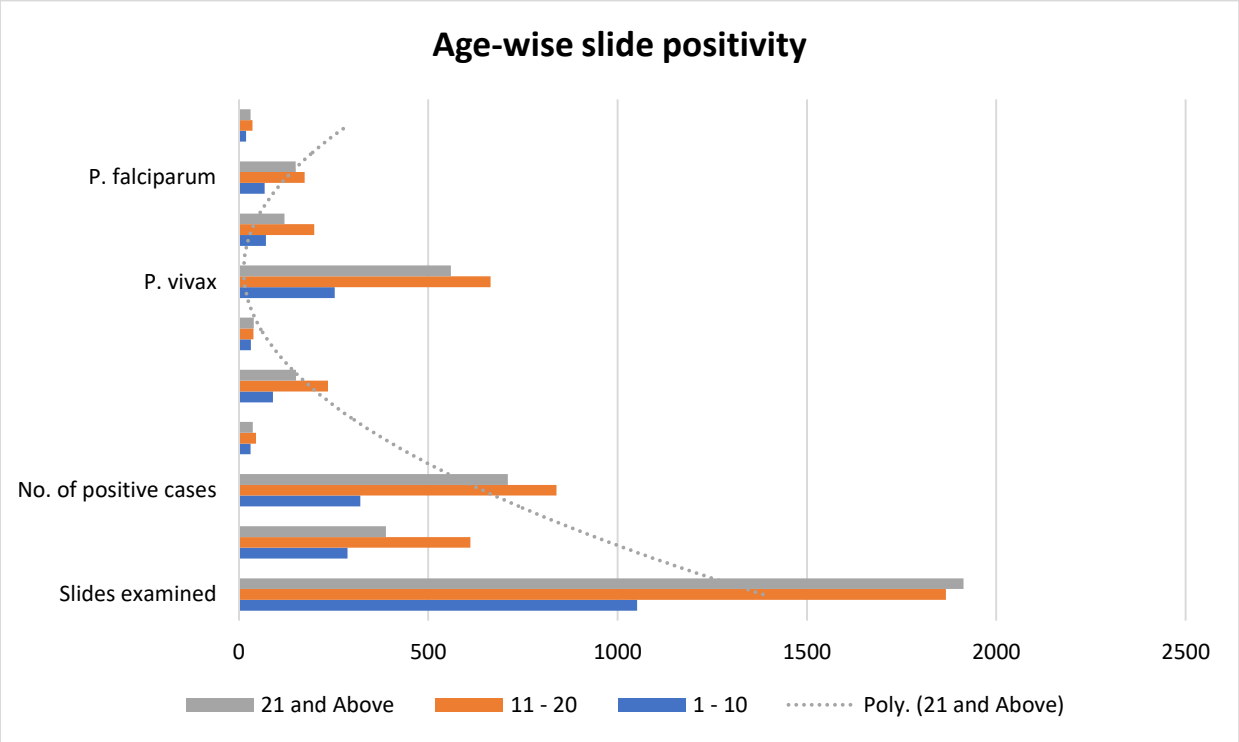
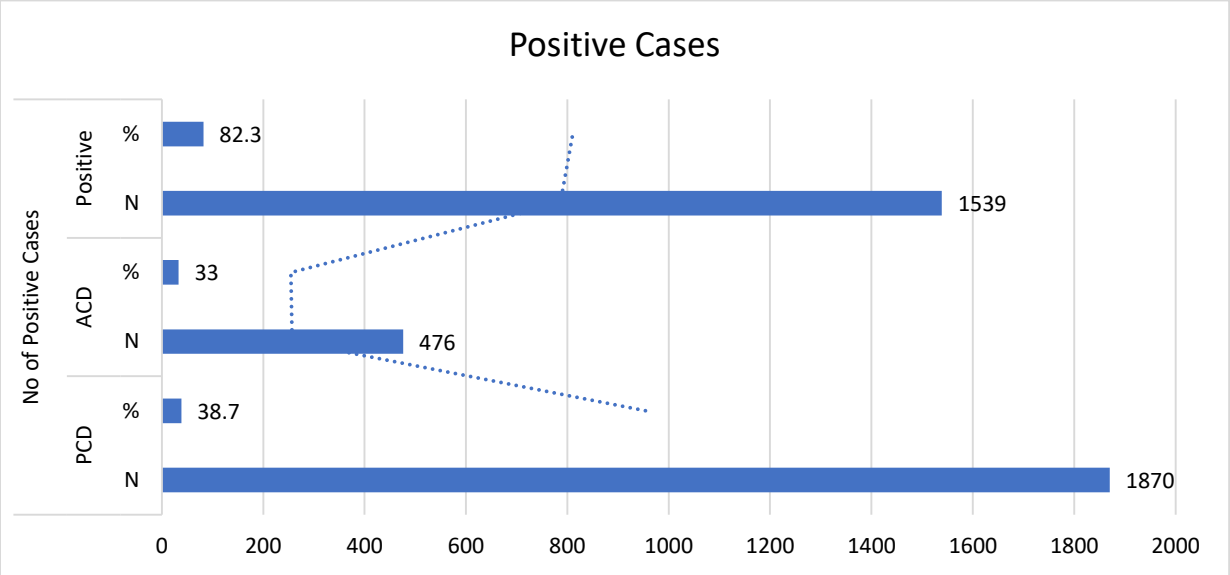


Table-4: Gender-wise slide positivity rate

Slides PCD	Examined Slides	No of Positive Cases						PCD P.v.	Males Positive			ACD P.v.	P.f.	Positive		PCD P.v.	Females Positive				
		PCD		ACD		Positive			P.f.	Positive							P.f.	Positive		ACD P.v.	P.f.
		N	%	N	%	N	%			N	%			N	%			N	%		
4833	1286	1870	38.7	476	33	1539	82.3	1188	351	292	61.3	216	76	402	21.5	341	61	113	23.7	86	27



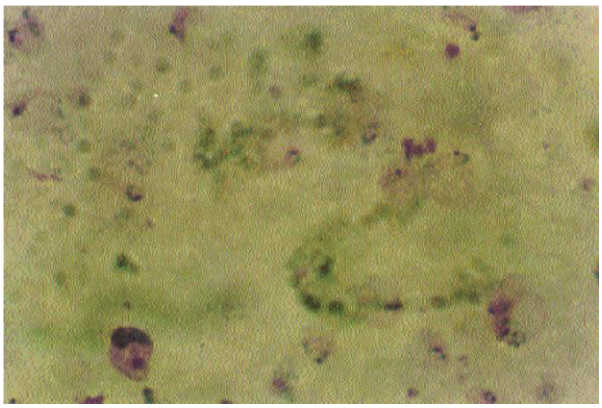


Figure-1: P. vivax Ring Stages in blood smear (1000x) and Gametocyte of a malaria case

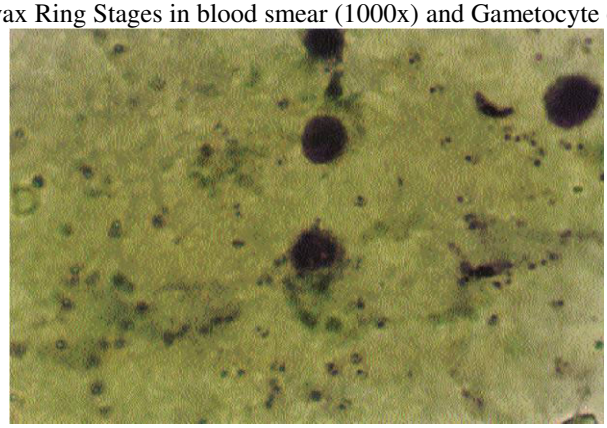


Figure-2: P. vivax Ring Stages in blood smear (1000x) and Gametocyte of a malaria case

Panjgur overall SPR is shown in Table I and III and it was noticed as 2346 / 6119 (38.3%). In the total malaria P. vivax cases were 1868 / 2346 (79.6%) as shown in Figure – I. In total malaria suspects of 6119, we found that 2346 cases (38.3%) were positive for the smear slides of malaria parasite. In the total sample population 1868 cases (79.6%) were because of the infection of Plasmodium vivax and 478 cases (20.3%) were observed with P-Falciparum. However, we also observed a seasonal variation: highest infection was P. vivax as 131 / 144 (90.9%) in the month of November and it was observed low in October as 83 / 176 (47.1%). The males were higher in prevalence as 1831 (78%). In terms of age the prevalence was observed about disease as 334 (81.2%) and 860 (80%) respectively 1 – 10 and 11 –

20 years. We observed no case of P. oval and P. malaria in the time span of research and also there was no relation of age group and infection type. Table I, II, III and IV respectively show the data of slide positivity in terms of area, positivity of slides month-wise, positivity rate in terms of age and gender wise rate of positivity.

DISCUSSION:

Malaria poses health hazard in Pakistan, back in 2000, across Sindh the incidence SPR as 5.9% in P. falciparum and P. vivax was observed respectively 65% and 35% cases [14] with a published review on malaria falciparum [15]. P. falciparum incidence was higher in comparison to the P. vivax respectively 65% versus 35% in the hundred malaria positive children [16]. Back in 2006, SPR incidence was (3.1%) in P. falciparum and P. vivax respectively 58% and 42% [17]. Mahmood is of the view that in the 348 fever patients were reported with SPR as 35% in P. falciparum and P. vivax respectively 88.5% and 9%. Nizamani states that in malaria control program of Sindh above 68,000 malaria parasites positive slides average SPR was observed as (2.4%). In the year of 2004 and 2005 an average ratio of P. falciparum was 33% (2004) and 37.2% (2005). High incidence of annual parasite was observed and increasing ratio of P. falciparum was observed in multiple districts of Sindh. Malaria parasite prevalence in human blood collected and examined in Karachi was also studied; in the 2457 collected samples positive cases were 311 [20].

In the region of Southern Punjab, plasmodium infected cases were (41%) [21]. In males' cerebral infection was common in KPK as (64%), specially under threat were pregnant cases [22]. In KPK, Afghani Refugees were facing the incidence of Falciparum [23].

Our research observed no case of P-oval and P. malaria. A research held in Multan also gives the same outcomes [24]. Higher incidence of P-vivax was observed in 60.5 percent cases [24]. Kashmiri Refugees were observed with an incidence of P. vivax as (90.4%) [25] in the region of Muzaffarabad.

Higher incidence of SPR as (88.5%) was observed in MCPB [6] of P. vivax cases in Ziarat, Baluchistan. High SPR incidence of P. vivax was seen in Zhob and Kohlu, Baluchistan [27]. P. vivax was common in the region of Southern Punjab (39.0%) in comparison to the P. Falciparum as (36.6%) [21]. Dominance of P. falciparum was seen in Karachi as 90.99% in comparison to the P. vivax as 9.0% [20].

CONCLUSION:

Infection of human malaria was frequently observed in the region of research, area of Baluchistan is one of the hottest areas of Pakistan. Among clinically-suspected malaria cases high positivity rate was observed. P. vivax was highly prevalent and it posed a significant threat to the healthcare; whereas, P. falciparum can also be a serious complication in addition to the cerebral malaria.

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