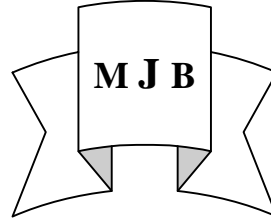


The Distribution Of Malaria In Rabiea Region In Northern Iraq

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Abstract

The region of Rabiea in northern Iraq, was having increasing number of malaria cases in January 1995 concerning farmers and their families. A screening was done among them using parasitological methods of laboratory diagnosed malaria. *P. vivax* was the only species of anopheles were recovered namely, *A. superpictus*, *A. sacharovi* and *A. pulcherimus*. The strains are the first time recovered in this region in northern Iraq.

The overall rate positivity (7.44%) was highest among persons aged (21-30) years (43.85%) and lowest among (51-60) years (2.47%) and above 61 years old was (0.48).

This study demonstrated statically insignificant difference in infection between males and females (Table 2). Seasonal distribution of infection with vivax was highest during Autumn months (52.88%) followed by summer (30.27%), winter (8.68%) and spring (6.94%). Statically study revealed just significant in summer and autumn (table 3).

The gradual control of this outbreak of malaria infection in 1995, through the years 1996 till the end of december 2000 might be due to the efforts of ministry of health by using insecticide and other methods including treatment directed against the infected people with malaria.

الخلاصة

تتضمن هذه الدراسة تحديد حالات تزايد من الملاريا للمزارعين وعوائلهم في مدينة ربيعة /الموصل في شهر كانون الثاني من العام

١٩٩٥. لقد وجد بان هنالك انواع من الملاريا شخصت على انها *P. vivax*, *A. superpictus* و *A. sacharovi*

A.pulcherimus

ان معدل انتشارها يتراوح بين (٧.٤٤ % - ٤٣.٨٥ %) للملاريا في (٣٠) عاما (% ٤٣,٨٥) للملاريا كانت بالنسبة

(٠,٤٨) للاعمار فوق (٦١) سنة ولوحظ بان هذه النسب بدأ بنقصان لفترة من ١٩٩٥ - ٢٠٠٠.

Intruduction

Malaria is widespread in the tropics and subtropics countries and remains a major public health problem in many parts of the world. Over 40% of the worlds population are at risk, and it is endemic in 91 countries, mostly developing [1] . WHO estimates that there are 300-500 million people infected with malaria [2]. Malaria in Iraq is becoming an important disease in the rural areas which have breeding places for mosquito vectors[2,3,4]. The prevalence of malaria infection in Iraq from 1970-75 was about 47395 cases [5] and from 1977-83 was about 20191 cases [6] .For assesment of malaria in a community some investigators [3,4,7,8,9] make use of the number of fever cases and parasites rate. Although detection of malaria parasites in peripheral blood smears give a true evidence of malaria infection. Other investigators[3,7,10,11] used entomological surveys, their results revealed the presence of some anopheline mosquitoes in areas of northern Iraq. The efficiency of transmission of the disease depends mainly on the presence of favorable environmental conditions for the occurrence of suitable anopheline mosquitoes [12,13].

The presence paper is the first study of the outbreak of human malaria in Rabeia region, (northern Iraq), this study conducted from Jan. 1995 till December 2000 when the outbreak was brought under controlled by health planners through vectors control measures, improved drainage to prevent anopheles breeding places, and isolation and treatment of infected persons. The main objectives of this study were to examine the farmers and their families especially those complaining from fever to confirm malarial cases parasitologically by laboratory methods and to asses frequency of suspected risk factors among these people and to provide recommendations, accordingly.

Material and methods

This study was carried out by frequent visits to Rabeiha region in the north of Iraq, during the period from January 1995 to December 2000.

Blood samples

Thin and thick blood smears were taken from farmers and their families who were suspected to having malaria especially those people who were suffering from fever. These smears were collected and stained with

Giemsa stain, and were examined under the microscope.

Diagnosis of positive cases

Positive cases of malaria were detected by examination of stained slides to identify the species of plasmodium.

Adult Mosquitoes

Positive adult mosquitoes were randomly collected from indoor i.e., living rooms, and out doors, resting places including stables, caves and summer huts by using aspirator and flash light, and pyrethrum spray technique inside human dwellings using a white sheet which was spread on the floor of the room after shutting all doors and windows. Pyrethrum spray then (0.1-0.2%) was applied for 10 minutes.

Results

The study area was mainly agricultural, all the villagers have ponds or tanks filled with water near their houses. The rainy season in this area lasts for approximately three months in winter and spring . In 1995 we noted that most of the people appeared to be complaining from symptoms of malaria, mainly fever, and those people came from region to Mosul city for treatment. The current

practice in the area of study is that a person suffering from fever suspected to be malaria goes to one of the local dispensaries in the villages or to the canter of endemic diseases in Mosul city. At these places blood smears are drawn, the result include, type of anopheline mosquitoes, type of plasmodium species, ages, sex seasonal distribution. Our results revealed for the first time the presence of three types of species of anopheline mosquitoes (A. superpictus, A. sacarovi and A. pulcherimus) . The last species was located in very small population in the area of study.

Out of 10821 examined slides only 806 were positive (7.44%) with *Pl. vivax* (table 1) during the period of study. Regarding age distribution, the average age was (21-30) years old (43.85%) (table 2).

Concerning sex distribution, the results revealed that there were no significant difference between both males and females (Table 2). The percentage of infection of seasonal distribution was highest during autumn months (52.88%) followed by summers(30.27%), winter`s (8.86%)and springs months (6.94%). Statistically study revealed just significant in summer and autumn .

Statistically study revealed just (Table 3) .
significant in summer and autumn

Table 1: Yearly Distribution Of *P.Vivax* Infection In Rabiea Region.

Year	No. of patient	No. of positive cases	Percentage	95%CL
1995	6406	557	8.69	8.02-9.41
1996	4112	238	5.78	5.10-6.55
1997	253	10	3.95	2.02-7.36
1998	50	1	2.00	0.10-12.01
1999	0	0	0.00	-
2000	0	0	0.00	-

Table 2 : Age And Sex Distribution Of *P. Vivax* Infections In Rabiea Region.

Age	No. of positive patients				Total %	P-Value
	Males	%	Females	%		
0.5-10 years	52	6.45	56	6.94	108 13.39	0.376
11-20 years	68	8.44	62	7.69	130 16.13	0.961
21-30 years	192	23.82	162	20.03	354 43.85	0.284
31-40 years	58	7.20	64	7.94	122 15.14	0.273
41-50 years	36	4.47	32	3.97	68 8.44	0.886
51-60 years	12	1.48	8	0.99	20 2.47	0.474
Above 61years	2	0.24	2	0.24	4 0.48	0.933
Total	420	52.10	386	47.80	806 99.90	0.825

Table 3: Seasonal Distribution Of P Vivax Infections In Rabiea Region. Summer And Autumn Just Significant.

Season months	No. of positive				Total	%	P-Value
	Male	%	females	%			
Winter	38	4.71	32	3.97	70	8.68	0.703
Spring	26	3.22	30	3.72	56	6.94	0.378
Summer	118	14.64	136	15.63	254	30.27	0.029<0.05
Autumn	238	29.54	188	23.34	426	52.88	0.024<0.05
Total	420	52.11	386	46.66	806	98.77	0.089

Discussion

In the present investigation, and for the first time only three species were recorded in the area of study namely A. sacharovi, A. superpictus and A. pulcherrimus. This result is in agreement with other entomological investigators [14] who reported that these mosquitoes are regarded as malarial vectors in Iraq. The study has shown that the first two mosquitoes mentioned above were widely distributed than the A. pulcherrimus i.e., a large number of these species were collected in the area investigated.

Similar results were recorded by other investigators[3,15,16]. Also the small number of A. pulcherrimus which was collected by this study is in agreement with the results of Al-Dabbagh, et.al.[93] .but Lyengar [14] were indicated that this species is widely

distributed in the central and southern region of Iraq and to a lesser extend in northern region. While Salman[17] indicated that A. pulcherrimus cannot be an important vector and probably play little or no part in malaria transmission. From our results ,we can say that the different in the density of mosquitoes distribution may vary in different regions and might depend on the different environmental and socioeconomic conditions in the area as well as the resting and feeding behavior of these mosquitoes.

Our study has shown that high rate of infection in 1995 in Rabiea region, and this is might be due to shortage of insecticides as well as the drugs for treatment of patients which needed for control of the malaria during economic sanction.

It seems from the results that the area of studies was subendemic with P. vivax infection in 1995 and 1996 were rate of infection was (8.69%,5.78%) respectively (table 1). In 1987, it was reported by Ali[16] that the rate of the infection was (96%)found in northern region were P. vivax was the only vector of malaria in this region.. It is probably true that the occurrence of malaria in northern of Iraq was due to improperly maintained irrigation canals and drainage ditches which created mosquitoes breeding places in and around the area of human residence as well as might be due to DDT resistant.

Concerning the age infection , it was recorded among nearly all age groups . The highest rate was among (21-30] years old in both males (23.82%) and female (20.03%) . And this might be attributed to that this group is more suitable for working in the farms than others . This result also agree with observations of previous studies by Mohammad et.al., and Macon [7,17] .

Our study revealed that the rate of infection of sex was recorded a little higher in males (52.10%) than females (47.80%). And this is might be due to that the males are more exposed to the bite of mosquitoes than females, because they are working in farms more than females , especially during the night for

the irrigation purpose . This finding is agree with the observation of previous studies by Mohammad et.al.,and Macon [7,17] .

Concerning the seasonal of infection was recovered a highest rate in Autumn months (52.88%) mainly in September and October , and to a lesser extend in Summer months . This higher rate of infection in these seasons might be attributed to that the same reasons that mentioned before about the increasing density and activities of mosquitoes during these seasons. This result is in agreement with that reported by Investigators [3,7,16,17] .

On conclusion malaria is subendemic disease in rural areas northern Iraq ,and the P. vivax was the only species and was the etiological agent for malaria in this region

It is recommended to carry on further studies of infection of mosquitoes in rural areas of northern Iraq.

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