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Analysis of the Prevalence and Impact of Malarial Parasite on primary School going children of Tehsil Mardan, Pakistan

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Abstract

This research study was conducted in general population of school going children in Tehsil Mardan from February to April 2014 for a period of three months in order to Analyze the Prevalence and Impact of Malarial Parasite on Primary School Going Children of Tehsil Mardan. The study was focused on 40 Government primary schools (Girls) of Tehsil Mardan. The study was carried by using two methods "Blood smear method" and "Questionnaire method" For Blood smear total of 1200 blood samples were selected randomly on daily basis from different schools of Tehsil Mardan and were statistically analyzed to check the effects of malaria on their schooling. The result showed that out of these samples 173(14.3%) students were infected in which 170(75.8 %) students from class 1-5 were infected by p.vivax and only 3(1.6%) students by p.falciparum. p.vivax is more than p.falciparum due to climatic condition of district Mardan. The maximum infection was recorded in children's of grades 1-3. Total number of infected students is 173 which show that total absenteeism of the students in Mardan during three months Feb-April was 14%. For Questionnaire method total of 12 questions were structured for 80 respondents (Primary school teachers) and then distributed in the selected schools to know about the environment of their schools. Therefore it is concluded from the research study that the prevalence of malarial parasite is depend on bad hygienic conditions inside the schools and their homes due to which most of the students are suffer and also it badly effects their studies.

Keywords: Malaria, Prevalence, Impact, Attendance, School Environment.

Introduction

Interest in studies and regular attendance are important factors in school success among children and youth. Studies show that better attendance is related to higher academic achievement for students of all backgrounds, but particularly for children with lower socio-economic status beginning in kindergarten, students who attend school regularly score higher on tests than their peers who are frequently absent[1]. Many factors can contribute to student absenteeism. Family health or financial concerns, poor school climate, drug and alcohol use, transportation problems, and differing community attitudes towards education are among the conditions that are often associated with a child's frequent absence from school[2]. The most important factor is the school climate. Some time school climate is poor which the cause of many parasitic diseases. One major disease which greatly affects student's attendance is malaria. Malaria is a tropical disease has been showed to reduce schooling achievement[3]. Malaria is infectious disease derived from two Greek words "mala" means "bad" and "area" means "air" so names as malaria[4]. Malaria is also called black water disease because it cause hemoglobunaria which lead to the dark color of patient's urine[5]. Malaria has affected an estimated 300 million peoples and causes more than a million deaths per year worldwide[6]. It kills more than other communicable diseases and is one of oldest known infection. Malaria is caused by female anopheles mosquito only which act as an intermediate host in transmitting infectious parasite *plasmodium* from man to man. The common species of anopheles are *A.Stephensi, A.Maculetus, A.Fluvilitis* and *A.Culicifancis*[4]. Malaria rank among the major health problems in Pakistan[6]. It is wide spread throughout the world mainly in the tropical and sub-tropical regions, but extending to some of the tamp rate areas. Humidity and rainfall are most important environmental factors in malaria epidemiology[6].

Malaria is parasitic disease transmitted through female anopheles mosquitoes. Certain climatic and geographic condition is necessary for vector reproduction and parasitic transformation and transmission. Broadly, harsher winters and cold temperatures are not suitable for prevalence of plasmodium parasite. Transmission rate are the highest with above 640F (180C) and no parasite incubation occur below 60oF (16oC). A minimum amount of rainfall is also necessary to provide the standing water for vector breeding, but too much rainfall (100 inches or more) can eliminate suitable breeding sites. At altitudes above 3281ft (1000m) there is at most minimal malaria incidence. These environmental and geographical limitations of the mosquitoes and the parasite result in heterogeneous geographic malaria incidence within the country[7].

Impact of Malaria on Children Educational Achievements: There are a number of ways through which malaria can impact

children's educational achievement.

First, malaria during pregnancy can lead to fetal growth retardation which translates into cognitive and physical impairment among children. Bleaky analyzed the long term impact of in utero and post anal exposure to malaria. Such exposure leads to considerably lower level of educational attainment and higher rates of poverty later in life[8].

Second, during pregnancy early childhood (under five), complicated form of malaria may developed rapidly. The effect of sever malaria, better known as cerebral malaria, these include headache, mental retardation, speech delay, bucco-facial dyspraxia, Diplegia, and frontal syndrome, dystonia, epilepsy and behavior and attention disorder.

Third, even during late childhood (which usually extends from 6 to 16 years of age), they can have a cognitive impact on educational achievement through school absenteeism[9].

Teacher's Views: i. All of the teachers mentioned absence to be the most prominent affect of malaria on children education. ii. They said that the children who were absent o longer period of time due to malaria had to study harder. iii. They also mentioned the disease affecting the children stability to learn and weak of health of the children made them poor listeners. iv. Students affected by malaria often had difficulties in solving various problems and had hard time remerging things. Poorer results and grades become common when a child had been absent for an extended period. v. Beside the impact on children education malaria also effect children social life at school. vi. Children who are absent for a longer period from school misses out on social-activities and this may lead to children being excluded from their friends and feeling lonely[10].

Hypotheses: i. There is a significant association between school going children and prevalence of malaria. ii. Prevalence of malaria decreases students' attendance.

Methodology

Participant: Participant in this study were school going children from class 1-5 from Government Primary schools and primary school teachers of different ages. Total 1200 school going children participated as a sample for prevalence of malarial parasite and 80 school teachers participated as respondents.

Instruments: Two types of instruments were used for the collection of data "Blood smear Method" and "Questionnaire Method". In Blood Smear Method Blood samples were collected from primary school going children of the selected schools in Tehsil Mardan on daily basis during three months Feb-April. To check the prevalence of malarial parasite Blood smear method were used. In Questionnaire Method questions were structured for respondents (Primary school teachers) and then distributed in the selected schools to know about the environment of their schools.

Procedure: A research study was conducted at Tehsil Mardan (KPK) in order to analyze the Prevalence and Impact of Malarial Parasite on Primary School Going Children of Tehsil Mardan. The study was focused on 400 Government primary schools (Girls) of Tehsil Mardan. The data was collected through Questionnaires. The Questionnaires were administered to the teachers of Government primary schools in Tehsil Mardan. In order to get solid and accurate information. The researcher visited most of the schools including in this study. Discussed the problem directly with them and recorded their views and suggestions on the spot. Two types of Questionnaire were structured. One for primary school head teacher (PSHT) and other for primary school teacher (PST). Questionnaire was based on 12 Questions for 80 respondents. To check the prevalence of malarial parasite Blood smear method were used.

Results and Discussion

Results: During research study from February-April 2014 total 1200 blood samples were collected from school going children's of different school in Tehsil Mardan KPK (Khyber Pakhtunkhwa) and questionnaire were structured based on 12 questions for 80 respondents.

Sector A: Schools; Bagh-E-Aram, Bijli Gar, Police Line, Labor Colony, Khazana Dheri, Sheikh Maltoon, Khora Banda; Quadrate Kali, Aslam Khan Koruna, Mehmand Menay
Sector B: Schools; Karwan, Sham ganj, Shadand Baba, Gul Bahar, Jamal Gari, Rorya, Shier Poor, Mahon Dheri, Behrman khan kali, and Tambulak
Sector C: Schools; Bikat ganj, City No 2, Hoty No 2, Sadiq Abad, kandar, Landakay, Bari Cham, Baboo Mahala, Lala Paar, Muhabat Abad.
Sector D: Schools; Amen Abad, Faram Koruna, Mayar, Gulshan Colony, Shankar Mehl, Paar Hoty 1, Paar Hoty 2, Bara Banda, Sehray Koruna, Rustam Khyl.

Table-1
Results of Blood Samples

Sectors	No of cases examined	Inf by p.vivax	% Age	Inf by p. falciparum	% Age
A	300	45	15	2	0.6
B	300	23	26.8	Nil	Nil
C	300	69	23	1	1
D	300	33	11	Nil	0
Total	1200	170	75.8	3	1.6

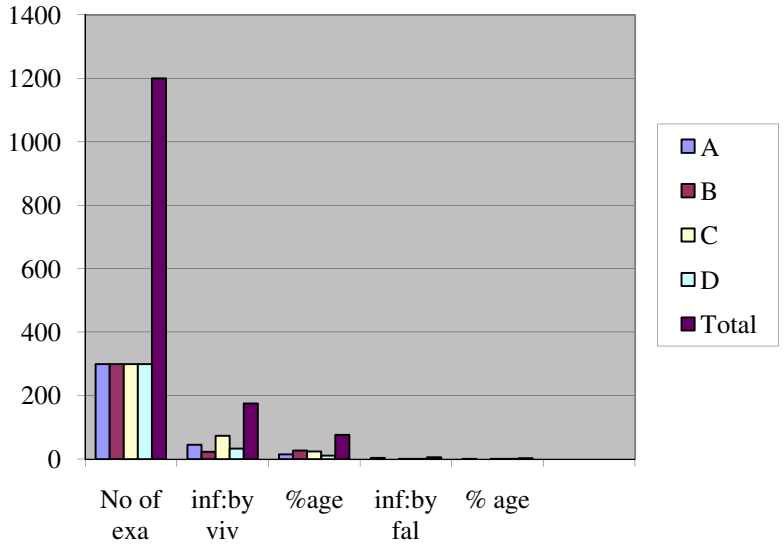

Figure-1
1200 blood films of school going children's of Tehsil Mardan

The data above clearly shows that total of 1200 blood films were examined in school going children's of Tehsil Mardan 175 (14.5%) were infected by *p.vivax* for all sectors and only 6 (3.3%) were infected by *p.falciparum* parasites. In sector A infection of *p.vivax* were recorded 45 (15%) and *p.falciparum* is 4 (1.3%). In sector B *p.vivax* infection were 23 (26.8%) while no result of *p.falciparum* were found. in sector C maximum infection of *p.vivax* were recorded 74 (24%) and minimum infection of *p.falciparum* were recorded. In sector D 33 (11%) of *p.vivax* and only 1% of *p.falciparum* were recorded. The highest rate of *p.falciparum* were recorded in sector A. Total number of infected students are 181 which shows that total absenteeism of the students in Mardan during three months Feb-April was 15%.

Table-2
Total absenteeism of students during Feb-April

Months	Infected students	%age
Feb	39	3.2
April	56	4.6
March	78	6.5
Total	173	14.3

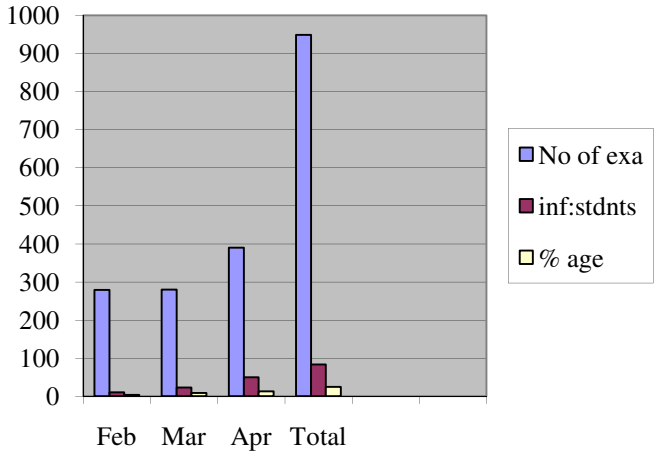

Figure-2
Total absenteeism of students during Feb-April

Findings of student's absenteeism: i. In sector A 48(16%) students were infected which shows that total absenteeism of students during three months Feb-April were 16%. ii. In sector B 25(8.3%) students were infected which shows that total absenteeism of students during three months Feb-April were 8.3%. iii. In sector C 75(25 %) students were infected which shows that total absenteeism of students during three months Feb-April were 25%. iv. In sector D 32(10.6%) students were infected which shows that total absenteeism of students during three months Feb-April were 10.6%. v. Total numbers of infected students were 181 which show that total absenteeism of the students in Mardan during three months Feb-April was 15%.

Findings of Teacher's Opinion: i. 80% of the respondents opined that the school environment is satisfactory whereas 20% said that it is satisfactory to some extent. ii. 67% of the respondents opined that the School Locality is satisfactory whereas 32.5% said that it is satisfactory to some extent. iii. 7.5% of the respondents opined that the Cleanliness is satisfactory whereas 37% said that it is available to some extent while 55% of respondents opposed it. iv.70% of the respondents opined that the health hygiene condition is satisfactory whereas

17%.said that it is available to some extent. v. 90% of the respondents opined that Sewerage System in the school is satisfactory whereas 10% said that it is available to some extent while 2% opposed it. vi. 77% of the respondents opined that Sewerage System in the school is satisfactory whereas 20% said that it is satisfactory to some extent while 2% opposed it. vii. 92% of the respondents opined that Cleanliness of School water is satisfactory whereas 7.5% said that the available water is satisfactory up to some extent. viii. 67.5% of the respondents opined that the purity of food is satisfactory whereas 32% said that it is satisfactory up to some extent. ix. 2.5% of the respondents opined that it occur yearly in the school whereas 50% said that it is available to some extent while 37% opposed it. x. 72.5% of the respondents opined that it occur to some extent while 27% opposed it. xi. 65% of the respondents opined that it is available in the school whereas 35% said that it is available to some extent.

Discussion: Malaria is a tropical disease has been showed to reduce schooling achievement[3]. Malaria rank among the major health problems in Pakistan it is wide spread throughout the world mainly in the tropical and sub-tropical regions, but extending to some of the tamp rate areas. Humidity and rainfall are most important environmental factors in malaria epidemiology[6]. Malaria can have a devastating effect on children's education. Repeated infections cause children to miss large periods of school and anemia, a side-effect of frequent malaria attacks, interferes with children's ability to concentrate and learn and causes chronic fatigue. Repeated illnesses from malaria can also exacerbate any malnutrition, which can both decrease the effectiveness of anti-malaria drugs and increase children's susceptibility to the other main killer diseases: diarrhea and pneumonia[11]. Malaria greatly effects children's education primarily absenteeism and can also causes cognitive disabilities and cognitive impairment and sometime cause neurological damage[10].

The present study was conducted at Tehsil Mardan (KPK) in order to analyze the Prevalence and Impact of Malarial Parasite on Primary School Going Children of Tehsil Mardan. The study was focused on 400 Government primary schools (Girls) of Tehsil Mardan. Out of 1200 slides 173(14.3%) were infected by *p.vivax* for all sectors and only 3(1.6%) were infected by *p.falciparum* parasites. Total number of infected students was 173 which show that total absenteeism of the students in Mardan during three months Feb-April was 14%.

The present study concluded that Malaria is most prevalent disease in Tehsil Mardan and causes due to bad climatic conditions. Malaria badly effect student's attendance and Primary school students are mostly suffered due to poor hygienic condition inside schools it weakened student's cognitive abilities and badly effect student's attendance.

Conclusion

It is concluded from the research study that the prevalence of malarial parasite is dependent on bad hygienic conditions inside the schools and homes due to which most of the students are suffer and also it badly affects their studies.

Recommendations: Following recommendations are cited keeping in view the finding and conclusion of the study. i. School environment should be suitable for health hygiene. ii. There should be one or two sweepers in each school for daily cleanness. iii. School should provide clean water and pure food for children. iv. Government should take necessary step for the yearly arrangement of awareness program against parasitic diseases. v. Schools must use insecticides method to prevent mosquito's growth. vi. School classroom should have proper availability of dustbins. vii. Government should focus on those factors which affects student's attendants.

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