

Human helminthes intestinal parasites of Morang district, Nepal

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Abstract

The present study examined association between ABO human blood group and helminth parasites. In total 3000 people were investigated and 1300 individuals were found infected with helminth parasites, namely *Ascaris lumbricoides* (52.46%), *Ancylostoma duodenale* (45.00%), *Trichuris trichura* (1.90%), *Enterobius vermicularis* (0.03%), *Taenia solium* (0.015%), *Hymenolepis nana* (0.15%).

Key words: ABO blood group, helminthiasis, prevalence rate, random sampling, stool samples

Introduction

Gastro-intestinal helminthiasis is an important cause of morbidity worldwide and affects a large proportion of human beings. Parasite induced cell reaction causes inflammation as a result of destruction of the host cell. The cell damage causes the secretion of histamine that dilates capillaries to increase blood flow to the damaged sites. An increase in number of eosinophils is one of the symptoms of the helminth infection.

A report of the First World War indicated that ABO system of different populations of the allied armies varied from one population to another. The important point to understand is that the most racial groups includes all types of the ABO system A,B,O or AB but in different proportions. These blood groups are permanent trait of an individual. Climate, illness or medical treatment cannot alter the groups which are inherited from parent. One example of frequency (%) of blood groups O, A, B and AB of different populations reveals English 45.8, 42.2, 8.7 and 3.2 Russian 32.9, 35.6, 23.2 and 8.1 Chinese 45.5, 22.6, 25.0 and 6.1 and Hindus 30.2, 24.5, 37.2, 8.1, respectively.

Reported the percentage frequencies of blood groups among the blood donor 909 individuals in which Welsh family names and non-Welsh family names showed for 'O' 52.7 and 46.6 for 'A' 35.0 and 42.0 for 'B' 9.7 and 8.3 for 'AB' 2.6 and 3.2. Gupta (1968) found in Bihar 21.55% individuals in A group 38.34% individuals in B group, 8.6% individuals in AB and 31.45% individuals in O group. He found no significant sex difference among male and female sexes. It has been examined the blood group of 339 cases of schistosomal hepatic fibrosis in Egypt. There was a higher incidence of blood group 'A' in the schistosoma cases (22%) with corresponding lower incidence of group 'O' (21.1%) (Clemens *et al.*, 1989).

Materials and Methods

By random sampling methods 3000 individuals were studied both for ABO blood group and the occurrence of intestinal helminth parasites in rural areas of different VDCs of Morang district, eastern, Nepal during Jan 2013 to December 2013.

Routine stool examination techniques

Stool samples were collected randomly in the screw capped containers with applicators sticks were taken and helminthes parasites were observed by direct smear method.

Routine ABO blood group examination techniques

The four types of A, B, AB and O blood group have different agglutinating properties to determine the blood group types of difference persons.. On a glass slide a drop of type A- serum (containing anti-B antibodies) is placed along with a separate drop of type-B serum (containing anti-A antibodies). Where a drop of O blood group is added to each drop there is no agglutination of RBCs in either cases. This shows that O blood group has neither A nor B antigen. In general, type-A RBCs are agglutinated by type-B serum and AB type RBCs are agglutinated by both sera.

Results and Discussion

Occurrence of intestinal helminthes parasites in different ABO blood groups have been shown in table 1. Out of 3000 individuals of total ABO blood grouping samples, 1700 (56.66%) were uninfected and 1300 (43.33%) were infected with helminth parasites.

Table 1. Occurrence of intestinal parasites in different ABO-blood group.

Blood group	Total no examined	Uninfected sample			Infected sample		
		Male	Female	Total	Male	Female	Total
O	880	300 (34.09%)	240 (27.27%)	540 (61.36%)	175 (19.88%)	165 (18.75%)	340 (38.63%)
A	865	290 (33.52%)	230 (26.59%)	520 (60.11%)	200 23.12%	145 16.76%	345 39.88%
B	933	275 (29.48%)	220 (23.57%)	495 (53.05%)	225 (24.11%)	213 (22.82%)	438 (46.93%)
AB	322	100 (31.05%)	45 (13.98%)	145 (45.03%)	110 (34.16%)	67 (20.80%)	177 (54.96%)
Total	3000	-	-	1700 (56.66%)	-	-	1300 (43.33%)

Among the population under 'O' blood groups, a total 880 out of 340 infected were male 175 (19.08%) and female 165(18.75%). Among the specific helminthes parasitic infections on 'O' blood groups are *Ascaris lumbricoides* (55.43%) and *Ancylostoma duodenale* (44.6%) in male while in female are *Ascaris lumbricoides* (55.75%), hookworm (42.84%) and *Trichuris trichura* (1.87%). A blood group, a total 865 out of 345 infested had male 200(23.12%) and female 145 (16.75%); and among male are *A. lumbricoides* 111 (55.5%), *Ancylostoma duodenale* 88 (44.0%) and *H. nana* 1 (0.5%) while in female roundworm 45 (31.03%), Hookworm 90 (62.06%) and *T. trichura* 10 (6.82%).

B blood group- Among 933, out of 438 are infected and its male 225(24.11%) are R. W. 125(55.55%), hookworm 98(43.55%), *Enterobius vermicularis* 2(0.88%) while it's female 213 (22.82%) are roundworm 108 (51.12%), hookworm 91(42.72%), *T.t.* 12(5.6%), *E.v.* 2 (0.98%)

AB- blood group- Among 322, out of 177 are infested and its male 110(34.16%) are R. W. 62(56.36%), *A.d.* 46(41.81%), *T. solium* 2(1.81%) while in female 67(20.8%) are R. W. (62.67%), *A.d.* 24 (35.82%) and *H. nana* 1 (1.4%).

The prevalence rate of total infection was higher in males (54.61%) as compared to female (45.39%). Thus Chi (X^2) square test was employed to determine the association between individuals of ABO blood system and the occurrence of intestinal helminth parasites. The experimental Chi-square (X^2) at 0.05 level of significant with 3 degree of freedom was less than the computed value $X^2 = 34.37$. Therefore it was concluded that there is significant difference between infected and uninfected samples and the impact of the ABO blood group on the occurrence of these intestinal helminth parasites. Therefore, the null hypothesis is rejected.

Area of habitation was the major factor determining helminthes prevalence infections rate of most helminthes was higher in males than females. These finding were statically significant. Intestinal helminth parasites is transmitted in males to be higher by the access to health care and education, by the absence of clean water sanitation and irregular use of foot wear. In the rural areas, the 4 blood groups shared the same environment and were of similar nutritional status and were likely to be exposed to similar levels of infections with intestinal helminthes as well as other infectious diseases.

The present result is different from that of the investigators (Gupta, 1968). Due to the environment and nutritional status, area of habitation and socio-economic status were also poor. This study illustrates the importance of controlling for socioeconomic circumstances in epidemiological investigations of helminthiasis. Area of habitation was a good indicator of both socio-economic factors and the level of geohelminths transmission and prevalence.

References

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