

Comparison of Hematimetric Findings between Healthy Children and Children with Giardia Parasite

Ali Fattahi Bafghi^{1,3}, Mouloud Taje Gardoon² and Seyed Hossein Shahcheraghi^{3,4*}

¹Medical Parasitology and Mycology Department, The School of Medicine, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

²Microbiology Department, The international campus, Shahid Sadoughi University of Medical Sciences and Health Services, Yazd, Iran

³Infectious Diseases Research Center, Shahid Sadoughi Hospital, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

⁴Department of Modern Sciences & Technologies, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

*Corresponding author: Seyed Hossein Shahcheraghi, Infectious Diseases Research Center, Shahid Sadoughi Hospital, Shahid Sadoughi University of Medical Sciences, Yazd, Iran, Tel: +989132531389; E-mail: shahcheraghii@gmail.com

Received date: January 22, 2018; Accepted date: August 20, 2018; Publishing date: August 27, 2018

Citation: Bafghi AF, Gardoon MT, Shahcheraghi SH (2018) Comparison of Hematimetric Findings between Healthy Children and Children with Giardia parasite. Ped Health Res Vol. 3: No.2:7.

Abstract

Introduction: A common agent that is transformed by contaminated water and food is Giardia lamblia. It is an agent with high prevalences in many developing countries. In this study, we presented comparison of Hematological aspects: children with Giardiasis and Healthy.

Materials and Methods: The study was performed between 30 children with Giardiasis and 30 children of control group. Age range of children was 3 to 10 years. They were children without any history of Giardiasis and children with symptomatic Giardiasis. Finally, the data related to hematological examinations was analyzed using SPSS version 19 statistical software. Chi-square test was used for data analysis of qualitative variables, and values were compared using independent T- test and Mann- Whitney-exact Test.

Results: RBC levels ($P < 0.001$) and hematocrit ($P < 0.001$) were high significantly in children with chronic disease towards controls. There was no significant difference in hemoglobin, MCV, lymphocytes, MCH, leukocytes and platelets levels between the two groups. Differences were observed significant at P-values of less than 0.05. The levels of MCHC ($P = 0.027$) and neutrophils ($P = 0.035$) decreased significantly in children with chronic Giardiasis compared to healthy controls.

Conclusion: MCHC and neutrophils indicated a low level in children with chronic Giardiasis towards controls. RBC and hematocrit levels were high in children with chronic disease compared to controls.

Keywords: Giardia lamblia, Children, Iran

Introduction

Intestinal parasites are as yet imperative an overall general medical problem. Giardia lamblia (GI), also known as Giardia.

duodenalis and GI is one of the critical intestinal parasites that reason both intense and interminable diarrheal sicknesses in human [1-4]. GI trophozoites adhere to sugars on intestinal epithelial cells through a parasite lectin that is enacted when it is separated by proteases, which are copious in the lumen of the duodenum [5]. It is the most common protozoan parasite of the human intestine around the world with rates of detection between 2-5% in the developed nations and 20-30% of the developing nations [6-9]. The giardiasis is related with poor clean conditions, deficient water treatment, day-mind focuses and institutional offices, for example, nursing homes. Infection is started by ingestion of growths from sullied sustenance and water and by individual to individual contact. Mucosal defenses against GI must act in the small digestive tract [10]. Notwithstanding wide research, the host reaction to disease stays enigmatic [10]. Infections with GI are generally self-constrained in safe skilled people [11]. Infections are common in children, particularly in child-care centers, backpackers, travelers, and homosexuals [12-15]. GI infection is frequently asymptomatic for kids. It isn't evident whether the underlying contamination is gained without delivering side effects, as disease may bring about a transient, mellow, diarrheal ailment that goes without take note [15,16].

The World Health Organization detailed that 200 million individuals in Asia, Africa and Latin America have side effects of giardiasis with somewhere in the range of 500,000 new cases a year, particularly among children [12-16]. It has been reported that levels of blood factors might change in children with chronic giardiasis [12-16]. The aim of study was to compare levels of blood factors in the children with giardiasis in comparison to normal subjects.

Materials and Methods

Our study was done in both children aged 3 to 10 years without any history of giardiasis (with stool test) who selected from Shahid Sadoughi University of medical sciences hospitals and children with typical giardiasis (diarrhea, vomiting, abdominal pain). A total of 30 children with giardiasis and 30

children of control group were examined in this study. A total of 3 ml of blood was drawn from every kid. This was then set into a K3EDTA pre-covered test tube for entire blood hematology determinations (4 ml: 14×75 mm, BD Vacutainer tube).

The hematological parameters were including hematological cells counts (including leukocytes, erythrocytes and platelets), leukocyte differential counts (neutrophils, lymphocytes), hemoglobin, mean corpuscular hemoglobin (MCH), mean corpuscular volume (MCV), hematocrit and mean corpuscular hemoglobin concentration (MCHC) was done using Coulter STKS (Beckman, USA).

Statistical Analysis

The data was calculated using SPSS Version 19 statistical software. Chi-square test was applied for data analysis related to qualitative variables, and data was compared using Mann-Whitney- exact Test and T- test. Differences were considered significant at P-values of less than 0.05. Informed consent was obtained from patients and parents.

Table 1: Comparison of Hematimetric Finding between Children with giardiasis and Healthy.

Groups	HGB (g/dl) (mean ± SD)	HCT % (mean ± SD)	MCV (fl) (mean ± SD)	MCH (pg) (mean ± SD)	MCHC (g/dl) (mean ± SD)	RBC (µl) (mean ± SD)
	13.98 ± 1.4	43.55 ± 3.87	73.74 ± 23.34	26.22 ± 1.82	32.19 ± 0.92	10.53 ± 16.6
Patient	MD=13.4	MD=41.7	MD=80.55	MD=27.15	MD=32.3	MD=5.32
	13.06 ± 0.64	39.31 ± 0.58	81.98 ± 0.94	27.4 ± 1.03	33.37 ± 1.24	4.76 ± 0.13
Healthy	MD=13.3	MD=39.1	MD=81.7	MD=27.7	MD=33.1	MD=4.78
TEST	T-test	Mann-Whitney	Mann-Whitney	T-test	T-test	Mann-Whitney
P-value	0.083	<0.001	0.91	0.096	0.027	<0.001

Table 2: Investigation of other parameters between Children with giardiasis and Healthy.

Groups	Lym(µl) (mean ± SD)	Nut(µl) (mean ± SD)	WBC(µl) (mean ± SD)	Plt(µl) (mean ± SD)
Patients	2.93 ± 0.37	3.74 ± 2.8	7.79 ± 2.31	248.44 ± 148.94
	MD=2.98	MD=2.7	MD=6.9	MD=206
Healthy	2.71 ± 0.45	4.04 ± 0.29	8 ± 0.68	310.3 ± 10.68
	MD=2.7	MD=4.05	MD=7.9	MD=308.5
Test	T-test	Mann-hitney	T-test	Mann-Whitney
P-Value	0.24	0.035	0.79	0.22

Discussion

The prevalence of giardiasis varies in terms of geographical and socio-economic states as well as the state of the host [12-16]. This disease is also an important subject in terms of blood parameters especially in the children [12-16]. In present study, alteration of blood cells and serum factors were undertaken in children aged 3-10 years with giardiasis in

Results

In this case-control study, 30 (19 boys and 11 girls) children with chronic giardiasis and 30 (18 girls and 12 boys) healthy children as a control group were included. This study was undertaken in both children aged 3 to 10 years without any history of giardiasis who selected from Shahid Sadoughi University of medical sciences hospitals and children with symptomatic giardiasis (diarrhea, vomiting, abdominal pain).

In this study, the levels of MCHC (P=0.027) and neutrophils (P=0.035) diminished essentially in kids with endless giardiasis contrasted with healthy controls. The levels of RBC (P<0.001) and hematocrit (P<0.001) increased significantly in children with chronic disease compared to healthy controls. There was no critical distinction in levels of hemoglobin, MCV, lymphocytes, MCH, leukocytes and platelets between the two groups. The results are presented in the **Tables 1 and 2**.

contrast with ordinary subjects. The consequences of this examination demonstrated that the levels of MCHC and neutrophils diminished fundamentally in kids with incessant giardiasis contrasted with healthy controls. The levels of RBC and hematocrit increased significantly in children with chronic disease compared to healthy controls. There was no significant difference in other blood factors and cells between the two groups. A study showed effect of giardiasis on total white blood

cells that were in infected children 7.000 cells/micro litters while in none infected were 7.850 cells/micro litters. Also, hemoglobin was in infected 11.87 gm /100 micro litters while in none infected were 10.05 gm/100 micro litters [17].

In a study, the examination of blood parameters showed that the blood in affected children with giardiasis has a significant reduction in terms of lymphocytes and monocytes. Whilst otherwise, white cells showed no significant differences [18]. According to a study by Demirci et al., the serum iron and zinc levels and erythrocyte superoxide dismutase activity were fundamentally lower, and malondialdehyde levels were essentially higher among the youngsters with ceaseless giardiasis contrasted with the control group ($p < 0.001$) [19]. In another study, iron deficiency anemia was found in 26.5% of the GI infected children. Mean serum hemoglobin, ferritin, hematocrit, and the proportion of serum iron to total iron-binding capacity were expanded ($P < 0.0001$) and mean red-cell conveyance width and iron-restricting limit were diminished after remediation ($P < 0.0001$) [20]. Finally, the prevalence of enteric pathogens among children in Gaza was significantly higher than in controls. The most common enteric pathogens isolated were *Entamoeba histolytica* and *Giardia lamblia*. Blood tests revealed that 21.8% of cases and 14.8% of controls had iron deficiency anemia, which were not significantly different. A significant difference was found between the TIBC and hemoglobin in cases compared to controls [21].

Financial Support and Sponsorship

Nil

Conflicts of Interest

There are no conflicts of interest.

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