



INTESTINAL PARASITES IN HOSPITAL DIAGNOSIS RECORDS IN KHARTOUM STATE (BASHAIR AND KHARTOUM BAHRI HOSPITALS)

Nawal OS¹, Medani M.Eltayeb^{1*}, Siddig BM², Osman MO¹

¹Faculty of Medical Laboratory Sciences, El-Neelain University, Sudan.

²Academy of Health sciences, Medical Laboratories Program, Sudan.

Corresponding Author:- **Medani M.Eltayeb**

E-mail: madanieltayeb@gmail.com

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ABSTRACT

The aim of this cross-sectional study was to create an avenue for the study of intestinal parasite diversity and prevalence of parasitic infection. The study was conducted through compilation of diagnosis records from hospital register of diarrheal causes diagnosed at outpatient clinics of Bashair and Khartoum Bahri Hospitals. The data was taken from daily sample records of three years 2011, 2012, and 2013. sample size was 11169, 12896 and 14963. Samples positive for *Giardia lamblia* (873, 1271, 2078). *Schistosomal* cases were 123, 47 and 29 respectively in 2011, 2012 and 2013, prevalence rate as estimated from the records was higher in males than in females. It was observed that schistosomal prevalence was in decline had a seasonal intensity and was more in the age group 5-15. The data collected from Khartoum Bahri Hospital records in the same period signified only *Giardia lamblia* only.

INTRODUCTION

Intestinal parasitosis refers to a group of diseases caused by one or more species of Protozoa, Cestodes, Trematods and Nematods. These parasites are among the most common infections world-wide. It is estimated that some 3.5 billion people are affected, and 450 million are ill as a result of these infections [1]. Intestinal parasitic infections are distributed virtually throughout the world with high prevalence rate in many regions [2]. The rate of infection is remarkably high in sub-Saharan Africa [3]. The most common intestinal helminth leading to digestive disorders include *Taenia Saginata*, *Hymenolepis nana*, *Ascaris lumbricoides*, *Ancylostoma duodenale*, *Strongyloides stercoralis*, *Trichuris trichiura*, *Enterobius Vermicularis* are usually transmitted from contaminated food or water or from environment. Some of the intestinal parasitic diseases are associated with severe morbidity that often results in mortality. Giardiasis, amoebiasis, ascariasis, hookworm disease, trichuriasis are common world-wide, and their impact on human health is high

[4,5]. Intestinal parasites affect people of all age; however, the impact on young children and pregnant women is severe. The high prevalence of IPI closely correlated with poverty, poor environmental hygiene and impoverishes health service, [6,7]. There is about 20 major helminthes infection of humans, affecting most of third of world population. The intestinal nematode *Ascaris lumbricoides* is one of the most common causes of infection among the soil-transmitted helminthes (STH). Common in the tropics and sub-tropics, it is estimated one quarter that more than of the world population infected with this helminthes; [8,9], and perhaps a similar number with parasitic protozoa.

Most of intestinal helminth and protozoa reported in the tropical and sub tropical zones also occur in the Sudan and have conducive conditions for spread in both urban and rural societies. Recent ecological and demographic changes, and the influx of people towards cities and urban communities may have impact on existing situation and add more pressure on the available health



service . however many diarrhea cases were mostly considered of diet causes and treated at house hold .In most hospitals and health centers symptomatic treatment may be given and less reference to laboratory diagnosis.

Laboratory diagnosis register is and important estimate of the prevalence of endemic parasitic diseases and an in disposable reference for health authorities, similar work was done by [10].

MATERIAL AND METHODS

This work was initiated to look into the diagnosis records of parasitic diarrheal causes in patients attending Bashair, and, Khartoum Bahri hospitals and to register and analyst they obtained data during the last three years 2011-2012-2013

Study locations

Bashair hospital is located north east of Khartoum and provides medical services to people inhabiting the south east area of Khartoum and Khartoum North locality. Mostly from Taif, Manshia, Gereif gharb and Soba proximities in Khartoum locality and Geraif Sharqu Hag Yousif, Soba sharqu and all the population from Khartoum Bahri localty and other adjacent areas that have access to the hospital were medically attended.

Khartoum Bahri hospital is in the metropolitan centre of Khartoum North adjacent to Deum Bahri and Hillat Hammad, Danagla and Khatmia but its location near the transport centre provided easy access to various patients from different origin who may be accidently attacked with diarrhea.

The provided daily records data were compiled into monthly data and an annual total .The data was sorted out into causative parasite gender and age of the patient and the obtained data was tabulated and analyzed.

It could be noted that for most patients simple diarrhea treatments who attended the nearest medical centre. The hospital register did not include patients living area.

Since the work was intended to verify the simple diarrheal causes and annual intensities 2011-2013 permits were allowed and record books were generously handed by hospital authority .

The technique used in Stool examinations was revised. It was found to be performed by direct method techniques for all patients. Specimens were carefully examined by medical laboratory technologists for the presence of parasites and /or their respective stage (cysts, trophozoites, ova and larvae) In Sudan, majority of the public health centers and hospitals do the direct wet mount as a routine laboratory diagnosis of Intestinal parasitic infections.

Direct methods by taking direct smears, two smears on class slide [10] two For examining intestinal protozoa ,Fecal preparations were made for examination. A drop of saline was placed at the center of one slide and a drop of 1% lugols and iodine 50% on a second slide for

detection of protozoan trophozoites and cysts. A small amount of fecal specimen was taken and the stool was thoroughly emulsified in saline and iodine using an applicator stick. A homogeneous thin film was prepared on each slide by mixing the stool with the drop of normal saline or iodine 50%. And a cover glass was placed on each preparation. The preparations were examined systematically using low (x10) and high (x40) power microscope.

The daily data records were examined and compiled into monthly data and the annual total was sorted out into causative parasite gender and age of the patient and the obtained data was tabulated in record books.

A retrospective laboratory record search and analysis was carried out for intestinal parasite examination and register .The records were collected from outpatient as well as inpatient departments during the period of three years from 1st January 2011 to 31 December 2013, Diagnosis records of Bashier Hospital and, Khartoum Bahari Hospital. The obtained data was arranged into age groups (5-15, 16-25, 26-44, >45 yrs), gender (Male/female).

RESULTS

The total of People referred to the laboratory for intestinal parasite detection of cause among those suffering from from diarrhea or other intestinal disturbances in Bashair hospitals in the years 2011, 2012, 2013 were 1032 among 11169, 1572 in 12899, and 2519 among 14903 stool speimen respectively (Tab1a, 1c and 1f).

Khartoum North Hospital the data in records was 144 in 432 examined specimens 202 in 565 and 271 in 639 in of stool sample found in records for 2011, 2012 and 2013 (Table 11a, 11c and 11f).

The highest reported data was in Basheir hospital and there was an increase in diagnostic records from 2011 - 2013 of the laboratory diagnosis result included *Giardia lamblia*, *schistosoma mansoni* 837 and 123 respectively in 2011 (received samples 11169). In 2012 *Giardia*, *schistosoma* and *teania* species were respectively 1247, 47, and 2 (received samples 12896) there was 251 cases of none parasitic causes. 2013 *Giardia lamblia* and *Schistosomes* were the only parasites in records however *Giardia* represented 2078 of the total received samples (14963), *Schistosomes* were 29 and the none parasitic causes were 417 (Table 1a,c and f). The intensity of *Giardia* was high in children (5-15) and in male more than in female. *Schistosome* diagnosis was more reported between August-December period and was found 97% in male children group of 5-15 years (Table 1b, d and g).

The monthly intensities in the diagnostic records may show that *Giardia* has the highest occurrence and of even monthly distribution, *Schistosomal* case were high in Bashair Hospital records and more frequently reported in the records of year 2011 it was high in male gender and and more frequent in the period August-December. *Giardia lamblia* could be indicated as of the most



occurrence in parasitic diarrhea and the *Entamoeba* could be second but among other parasitic helminthes *taenia species* was twice reported, however there was general increase in parasitic diarrhea records in summer including the rainy season.

Khartoum Bahri hospital records of 2011, 2012 and 2013 revealed only *Giardia lamblia* cases and apparently the available figures fewer cases were referred for laboratory confirmation or otherwise there may be a non-systematic register.

Table1a. Parasite diagnosis records at Bashier Hospital (2011)

Costive Month	<i>Entameba</i>	<i>Giardia</i>	<i>Schistosoma</i>	<i>Teania Spp</i>	<i>Other</i>	<i>Bacteria</i>	Total positive	Total
January		65	-		5		70	1100
February		70	-		1		71	862
March		77	4		1		82	921
April		80	5		2		87	175
May		78	8		-		87	925
June		80	7		1		88	1233
July		80	7		1		88	1138
Augustus		60	30		3		93	1255
September		65	18		2		85	1245
October		77	20		1		98	1220
November		75	14		2		91	189
December		66	10		10		92	906
Total positive		873	123		29		1032	11169

Table 1b. The distribution of infected individuals with intestinal parasites with respect to age and gender (2011)

Causative	Total number	Gender		Age group								
		Male	female	(5-15)		(16-25)		(26-45)		(more than 45)		
<i>Entamoeba</i>	-	-	-	-	-	-	-	-	-	-	-	-
<i>Giardia</i>	873	578	295	300	128	107	112	151	50	20	5	
<i>Schistosoma</i>	123	121	2	82	0	29	2	10	0	3	3	
<i>TaeniaSpp</i>	-	-	-	-	-	-	-	-	-	-	-	
<i>Encylostoma Duodenale</i>	-	-	-	-	-	-	-	-	-	-	-	

Table1c. Parasite diagnosis records at Bashier Hospital (2012)

Costive Month	<i>Entameba</i>	<i>Giardia</i>	<i>Schistosoma</i>	<i>Teania Spp</i>	<i>Other</i>	<i>Bacteria</i>	Total positive	Total
January		65	8	1	20		94	808
February		50	5	1	22		78	853
March		66	5	-	15		86	906
April		45	5	-	12		62	1114
May		50	6	-	25		81	1153
June		45	7	-	23		75	1980
July		115	5	-	58		178	1142
Augustus		320	1	-	20		341	1317
September		150	1	-	15		166	1172
October		125	1	-	10		136	1023
November		110	2	-	15		132	920
December		125	1	-	17		143	908
Total positive		1271	47	2	252		1572	12896



Table d. The distribution of infected individuals with intestinal parasites with respect to age and gender(2012)

Causative	Total number	Gender		Age group								
		Male	female	(5-15)		(16-25)		(26-45)		(more than 45)		
<i>Entamoeba</i>	-	-	-	-	-	-	-	-	-	-	-	-
<i>Giardia</i>	1271	950	321	386	125	290	113	194	72	80	11	
<i>Schistosoma</i>	47	38	9	19	3	6	5	12	1	1	3	
<i>Taenia Spp</i>	2	2	0	0	0	0	3	2	0	0	3	
Other	252	153	99	87	34	25	17	28	38	12	10	
Bacteria	-	-	-	-	-	-	-	-	-	-	-	

Table f. Parasite infection records at Bashier Hospital (2013)

Costive Month	<i>Entameba</i>	<i>Giardia</i>	<i>Schistosoma</i>	<i>Teania Spp</i>	Other	Bacteria	Total positive	Total
January		130	-		25		155	905
February		112	1		-		113	785
March		125	-		15		140	1068
April		122	-		18		140	1039
May		120	-		15		135	968
June		125	-		14		139	1056
July		215	1		75		291	1486
Augustus		225	-		55		280	1482
September		212	-		50		262	1686
October		212	5		50		262	1686
November		255	12		45		312	1556
December		255	10		55		290	1186
Total positive		2078	29		417		2519	14903

Table 1g. The distribution of parasite records with respect to gender and age (Bashair Hospital(2013)

Causative	Total number	Gender		Age group							
		male	Female	(5-15)		(16-25)		(26-45)		(more than 45)	
<i>Entamoeba</i>	-	-	-	-	-	-	-	-	-	-	-
<i>Giardia</i>	2078	1511	568	820	125	255	212	300	110	136	121
<i>(BSchistosoma</i>	29	23	6	8	2	9	3	5	1	1	0
<i>TaeniaSpp</i>	-	-	-	-	-	-	-	-	-	-	-
Other	417	268	149	75	50	92	18	26	55	75	26
Bacteria	-	-	-	-	-	-	-	-	-	-	-

Table 2a. Internal parasite records at Khartoum Bahari Hospital (2011)

Costive Month	<i>Entameba</i>	<i>Giardia</i>	<i>Schistosoma</i>	<i>Teania Spp</i>	Other	Bacteria	Total positive	Total
January	3	7			3		13	33
February	3	5			12		20	46
March	6	8			-		14	35
April	1	5			2		8	25
May	2	3			1		6	10
June	-	2			7		9	12
July	4	7			1		12	42
Augustus	7	9			5		21	58
September	4	3			-		7	63
October	5	4			-		9	44
November	4	6			3		13	36
December	3	5			4		12	28
Total posi	40	64			38		144	432



Table 2b. The distribution of internal parasite diagnosis records with respect to gender and age (Khartoum Bahri Hospital (2011))

Causative	Total number	Gender		Age group							
		Male	female	(5-15)		(16-25)		(26-45)		(more than 45)	
<i>Entamoeba</i>	40	27	13	13	5	7	4	5	3	2	1
<i>Giardia</i>	64	43	21	22	9	13	5	7	5	1	2
<i>Schistosoma</i>	-	-	-	-	-	-	-	-	-	-	-
<i>TaeniaSpp</i>	-	-	-	-	-	-	-	-	-	-	-
Other	48	30	18	15	10	9	6	4	2	2	-
Bacteria	-	0-	-	-	-	-	-	-	-	-	-

Table 2c. Parasite diagnosis record at Khartoum Bahari Hospital (2012)

Costive Month	<i>Entameba</i>	<i>Giardia</i>	<i>Schistosoma</i>	<i>Teania Spp</i>	Other	Bacteria	Total positive	Total
January	2	6			13		21	30
February	3	-			8		11	26
March	2	8			13		23	54
April	3	5			14		22	42
May	1	4			16		21	38
June	1	7			12		20	39
July	1	6			-		7	15
Augustus	-	7			4		11	27
September	3	12			9		24	65
October	3	6			6		15	70
November	2	9			3		14	83
December	8	5			-		13	76
Total positive	29	75			98		202	565

Table 2d. The distribution of parasite diagnosis records with respect to gender and age at Khartoum Bahri Hospital (2012)

Causative	Total number	Gender		Age group							
		Male	female	(5-15)		(16-25)		(26-45)		(more than 45)	
<i>Entamoeba</i>	29	15	14	6	5	4	3	3	4	2	1
<i>Giardia</i>	75	35	40	15	18	11	17	5	2	4	3
<i>Schistosoma</i>	-	-	-	-	-	-	-	-	-	-	-
<i>Taenia Spp</i>	-	-	-	-	-	-	-	-	-	-	-
<i>Other</i>	98	53	45	20	17	18	21	13	5	3	2
<i>Bacteria</i>	-	-	-	-	-	-	-	-	-	-	-

Table 2f. Parasite diagnosis records at Khartoum Bahari Hospital (2013)

Costive Month	<i>Entameba</i>	<i>Giardia</i>	<i>Schistosoma</i>	<i>Teania Spp</i>	Other	Bacteria	Total positive	Total
January	3	15			2	-	18	24
February	5	10			2	5	22	37
March	6	5			11	-	22	45
April	5	10			4	-	19	32
May	8	10			5	10	33	54
June	8	5			5	8	26	61
July	2	1			12	-	15	65
Augustus	13	3			10	-	33	70
September	4	18			4	6	32	69
October	2	8			-	-	10	57
November	5	10			16	-	31	76
December	6	4			8	-	18	58
Total positive	69	99			79	29	279	639



Table 2g. The distribution of parasite diagnosis records according to gender and age (Khartoum Bahri Hospital(2013)

Causative	Total number	Gender		Age group							
		male	female	(5-15)		(16-25)		(26-45)		(more than 45)	
<i>Entamoeba</i>	69	41	28	19	9	13	6	7	9	2	4
<i>Giardia</i>	99	54	45	23	18	21	16	7	8	3	3
<i>Schistosoma</i>	-	-	-	-	-	-	-	-	-	-	-
<i>Taenia Spp</i>	-	-	-	-	-	-	-	-	-	-	-
<i>Other</i>	79	49	30	19	17	15	9	13	4	2	-
<i>Bacteria</i>	29	18	11	8	5	6	4	3	2	1	-

DISCUSSIONS

Intestinal parasites infections are of wide spread in Africa, Asia and South America. Variable species of protozoa and helminthes dominate depending on climate, their inter transmission is human activities feeding behavior and the level of hygiene. The treatment and control of the important ones posed a great financial load on governments, Therefore for proper treatment and control strategies, many countries adopted a monitor system of their prevalence ,specially the endemic one by establishing and improving a record system at the diagnostic laboratories besides efficient hospital laboratories .and compile each diagnostic data to remain as reliable epidemiological information.

Hospital cross sectional based studies, where routine parasitological examinations were ordered by a physician ,each individual case properly received examined and registered by a trained efficient and reliable laboratory personnel may provide an insight of parasitic diseases situation. Study was provided by [11] in Almadinah Almunawarh, KSA, out of 889 stool specimens collected from children, *giardiasis* was detected in 1.9% of them. In Australia in hospitals receiving immigrant children 18%were carriers of parasitic pathoges,11 were *Strongyloides stercoralis*, in a similar study in South Sudan conducted by Mogambo 1998,13% of child age 13% were positive for hook worms *Strongyloides stercoralis* and Ascaris, 28% for *Entamoeba coli* and9.8%were positive for *Giardia lamblia*. 28% of the children had *Entamoeba histoletica* In this study it was observed that the register

may have contained far more less than the number referred for laboratory diagnoses, may be due to lack of emphasis on the importance of a proper register, or the work load on the technical staff, however the register data showed more than 60% *Giardia lamblia* and about 10% *Schistosoma* infection no nematode records and neither *Entamoeba histoletica* and 2 case of *Taenia saginata*, the infections were higher in male gender and more common in 5—15 age group. High *Schistosma* infections in male was explained by more access of males to infected water sources, but the dominance of *Giardia lamblia* infection in this age group could not be explained. The data provided by Khartoum Bahri hospital register showed only *Giardia lamblia* in the three years record. The lack of register of other parasites need further investigation since the hospital is present under Sudanese condition.

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CONFLICT OF INTEREST:

The authors declare that they have no conflict of interest.

STATEMENT OF HUMAN AND ANIMAL RIGHTS

All procedures performed in human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

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