Prevalence of intestinal parasite infections and associated clinical symptoms among patients with end-stage renal disease undergoing hemodialysis

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Abstract

Introduction & Aim: Intestinal parasitic infections (IPIs) can result in high morbidity and mortality, particularly in immunocompromised patients. Infectious diseases are among the main causes of death in end-stage renal disease (ESRD) patients due to their impaired immune systems. The aim of this study was to determine the prevalence IPIs and their associated symptoms in ESRD patients.

Methods: In this case-control study, the fecal samples of 78 ESRD patients undergoing hemodialysis and 140 controls without any kidney problems were analyzed for intestinal parasites using direct-smear, formol-ether and modified Ziehl-Neelsen staining techniques.

Results: The difference in the prevalence of IPIs between ESRD patients (30.7%) and the control group (10.7%) was significant (OR=3.7; 95% CI=1.8-7.61; P<0.001). Blastocystis (14.1%) and *Cryptosporidium* spp. (11.5 %) were the most common IPIs detected in ESRD patients and the presence of *Cryptosporidium* spp. was significantly associated with diarrhea in ESRD patients (OR=16; 95% CI=1.54-166.05; P<0.05). Leukocytosis, diarrhea, weight loss, nausea/vomiting and bloating were also significantly higher in the hemodialysis group when compared with the control group.

Conclusion: The current study revealed a high prevalence of intestinal parasites and related clinical symptoms in ESRD patients undergoing hemodialysis. Since hemodialysis patients are immunocompromised and intestinal parasites can cause serious clinical complications, we suggest that stool examination for intestinal parasites with an emphasis on detection of *Cryptosporidium* spp. and Blastocystis, should be incorporated into the routine clinical care for these patients. Measures for preventing the acquisition of IPIs are also recommended.

Image

Table 1 Demographic characteristics of hemodialysis patients, according to the presence or absence of intestinal parasites

Variable	Parasitized ($n = 24$)		Non-parasitized ($n = 54$)		Odds ratio (95 % CI*)	*P* value
	N	%	*N*	%		
Sex						
Male	14	58.3	36	46.1	0.7 (0.26–1.88)	0.479
Female	10	41.7	18	23.1	1.42 (0.53–3.84)	
Age						
20–34*	4	16.7	10	18.6	1	0.65
35–49	5	20.8	14	25.9	0.89 (0.19–4.19)	
50–64	7	29.1	9	16.6	1.94 (0.42–8.92)	
≥65	8	33.4	21	38.9	0.95 (0.23–3.93)	
Residence						
Urban	11	45.8	42	77.8	0.24 (0.09–0.67)	<0.05
Rural	13	54.2	12	22.2	4.13 (1.48–11.56)	
Hemogram						
Leukocytosis	13	54.1	3	5.5	20.09 (4.88–82.65)	<0.001
Leukopenia	4	16.6	5	9.2	1.96 (0.48–8.06)	0.445
Type of stool sample						
Diarrhea	13	54.1	4	7.4	14.77 (4.03–54.03)	<0.001
Normal	11	45.9	50	92.6	0.07 (0.02–0.25)	

* The first subgroup of age is considered as the reference

Table 2 Comparison of prevalence and identified symptoms of intestinal parasites between hemodialysis patients and control group

Variable	Hemodialysis patients ($n = 78$)		Control group ($n = 140$)		Odds ratio (95 % CI*)	*P* value
	N	%	*N*	%		
Sex						
Male	14	18.0	9	6.4	0.93 (0.25–3.47)	0.918
Female	10	12.8	6	4.2	1.07 (0.28–3.98)	
Age						
20–34*	4	5.1	2	1.4	1	0.853
35–49	5	6.4	5	3.6	0.50 (0.06–4.09)	
50–64	8	10.2	4	2.8	1 (0.12–7.99)	
≥65	7	9.0	4	2.8	0.87 (0.11–7.11)	
Hemogram						
Leukocytosis	16	20.5	7	5	4.90 (1.92–12.53)	<0.001
Leukopenia	9	11.5	7	5	2.48 (0.88–6.94)	0.076
Type of stool sample						
Diarrhea	17	21.8	7	5	5.29 (2.08–13.43)	<0.001
Normal	61	78.2	133	5	0.18 (0.07–0.47)	
Symptoms						
Weight loss	26	33.3	20	14.2	3 (1.54–5.85)	<0.001
Feeling of weakness	47	60.2	10	7.1	19.71 (8.97–43.30)	<0.001
Stomach pain	32	41	55	39.2	1.07 (0.61–1.89)	0.801
Abdominal pain	25	32	38	27	1.27 (0.69–2.31)	0.443
Nausea or vomiting	19	24.3	15	10.7	2.68 (1.27–5.65)	<0.05
Bloating	25	32	4	2.8	16.04 (5.33–48.28)	<0.001

* The first subgroup of age is considered as the reference



Biography

Gholamreza Baezegar has completed his MSc in Medical Parasitology from Mazandaran University of Medical Science and is currently a PhD student in Shiraz University of Medical Sciences, Iran. He is Chief of Parasitology Department at 29 Bahman Hospital, Iran and has published more than 8 papers in journals.

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