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RESEARCH ARTICLE

PREVALANCE OF INTESTINAL PARASITOSEs WHICH ARE OF GREAT IMPORTANCE IN IMMUNE DEFICIENCY IN DIALYSIS PATIENTS.

Abdurrahman Ekici and Hasan Yılmaz.

Van Yüzüncü Yıl University, Faculty of Medicine, Parasitology Department, Van, Turkey.

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Abstract

Objective: The aim of this study is to determine the prevalence of intestinal parasites which are of great importance in immune deficiency in dialysis patients.

Methods: This study was conducted in the Parasitology Laboratory, Dursun Odabaş Medical Center, Van Yüzüncü Yıl University between the dates, June 2010 - February 2011. Fifty six women and 44 men having chronic renal failure and entering dialysis, totally stool samples of 100 patients as the test group and the stool samples of 30 healthy people as the control group were examined parasitologically through the native-Lugol, flotation and modified acid fast staining methods in this study.

Results: In the study, in 44% of the stool samples of the dialysis patients were found parasite species. *Cryptosporidium* sp. was found only in one of the stool samples of the control group of 30 healthy people. *Cryptosporidium* sp. was found as 32% and *Cyclospora cayetanensis* as 1% of the patients. A statistically significant variance was found between the mean frequency of *Cryptosporidium* sp. and chronic renal failure ($p < 0.001$).

Conclusion: Consequently, it was certain that *Cryptosporidium* sp. and *C. cayetanensis* must be primarily considered in dialysis patients suffering from diarrhea, abdominal pain, nausea, constipation, loss of appetite.

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Introduction:-

In healthy people, some parasitic diseases that are not pathogenic and cause no symptoms may be much more severe in immunosuppressed patients for any reason, such as AIDS, cancer, organ transplantation patients and dialysis patients. The most frequent and opportunistic protozoan intestinal parasites in these patient groups were *Cryptosporidium* sp. and *Cyclospora cayetanensis* (Özcel et al., 2007).

Cryptosporidiosis is a zoonotic infection of *Cryptosporidium* species in mammals, reptiles, poultry and fish. In cryptosporidiosis, the role of the immune system in humans and animals is very important. Because especially the cases where the infection is severe or the deaths are seen are immunocompromised patients (Zau et al., 2017).

Although cyclosporiasis is reported in many countries around the world, it is more common in tropical and subtropical regions. It has been rarely reported in developed countries where infection is thought to be more related to international travel or consumption of imported products (Özcel et al., 2007; Isaacs et al., 1985).

The definite diagnosis of opportunistic protozoan infections is made by the presence of oocysts in the faeces. Oocysts that can not be detected or can not be detected by direct observation can be detected more easily by using some staining methods. Mainly used methods are modified acid fast, auramin-rhodamine and acridine orange staining methods. Oocysts, volume and morphologically, may be confused with many factors such as yeast cells, fungal and mold spores. This method is the cheapest, reliable, specific and diagnostic value modifiable acid fast staining method to distinguish these structures from oocysts (Hunter and Nichols, 2002; Fichtenbaum et al., 1993; Jokipii et al., 1983; Al Braiken et al., 2003; Miller et al., 2003; Gödekmerdan et al., 1999; Üner et al., 1991; Otağ et al., 2007; Tamer et al., 2008).

The aim of this study is to determine the prevalence of intestinal parasites in dialysis patients, which is more important in immunocompromised patients.

Materials And Methods:-

This study was carried out between June 2010 and February 2011 at Van Yüzüncü Yıl University Dursun Odabaş Medical Center Research Hospital Parasitology Laboratory. In the study, stool samples of 100 patients (56 female and 44 male) who had chronic renal failure (CRF) as a trial group and entered treatment dialysis; In the control group, stool samples of 30 healthy individuals, 16 female and 14 male, were examined parasitologically. In addition, the symptoms of the illness were recorded separately and a questionnaire including income level, education status, residence status, some living conditions and habits was conducted. The stool samples from the experimental and control groups were microscopically examined for intestinal parasites using flotation with native-Lugol and saturated zinc sulfate solution, respectively. Then, the samples were stained with modified-acid-fast staining to examine for *Cryptosporidium* sp., and *C. cayetanensis*.

Results:-

In this study, 44 (44%) of the stool samples of 100 dialysis patients had one or more parasites. *Cryptosporidium* sp. was found only in 3.3% of 30 healthy stool samples produced as a control group. In our study, *Cryptosporidium* sp. (Figure 1), *B. hominis*, *G. intestinalis*, *C. mesnili*, and *C. cayetanensis* (Figure 2) were detected as 32%, 7%, 3%, 2% 1% in patients, respectively. Diarrhea is caused by both *C. cayetanensis* and *Cryptosporidium* sp. in a 14-year-old girl with occasional constipation, vomiting and headache complaints together stool specimens were analyzed by modified-acid-fast staining method, and 37.5% oocysts were high, 40.6% were moderate and 21.9% were low in 32 parasite positive patients.

In statistical evaluation, there was a significant difference ($p < 0.001$) between the trial and control groups in terms of frequency of occurrence of *Cryptosporidium* sp. There was no significant relationship between the incidence of *Cryptosporidium* sp. and sex, and also between *Cryptosporidium* sp. and age incidence ($p > 0.05$). Significant correlations were found statistically between the frequency of *Cryptosporidium* sp. and abdominal pain ($p < 0.01$), diarrhea ($p < 0.01$), constipation ($p < 0.05$), nausea ($p < 0.01$), loss of appetite ($p < 0.01$), headache ($p < 0.01$), cough ($p < 0.01$), respiratory distress ($p < 0.05$), growth retardation ($p = 0.05$) and oral saliva flow in sleep ($p < 0.05$). There were no significant correlations statistically between the frequency of *Cryptosporidium* sp. and income level, education status, residence status, some living conditions and habits, and frequency of encountering parasites ($p > 0.05$).

Discussion:-

In studies conducted in many countries around the world, the spread rate of *Cryptosporidium* sp. and *C. cayetanensis* infections varies depending on the patient group, climatic conditions, socioeconomic status and hygiene rules (Özcel et al., 2007).

While the prevalence of *Cryptosporidium* sp. in the various regions of the world was 3.2-32% (Hunter and Nichols, 2002; Fichtenbaum et al., 1993; Jokipii et al., 1983; Al Braiken et al., 2003; Miller et al., 2003; Højlyng et al., 1986), in our country it was 0.1-12.35% (Gödekmerdan et al., 1999; Üner et al., 1991; Otağ et al., 2007; Tamer et al., 2008; Çiçek and Yılmaz, 2011). In this study we found *Cryptosporidium* sp. oocysts in 32% of 100 dialysis

patients with CRF. This rate was similar to other studies in our country with patients with CRF (Dökmetaş et al., 1998; Ok et al., 1996).

Previous studies have shown that the prevalence of *Cryptosporidium* sp. is high in patient groups with immunosuppression and this rate is much higher in dialysis patients (Dökmetaş et al., 1998; Ok et al., 1996). In this study, it was seen that dialysis patients were at risk of getting opportunistic parasitosis such as *Cryptosporidium* sp.

It has been observed that statistical calculations have not been made generally in researches on *Cryptosporidium* sp. both in the world and in our country in the immunocompromised patients. In our study, *Cryptosporidium* sp. was detected in 32% of 100 dialysis patients with CRF, and there was no significant difference between frequency of parasitism and age and sex.

In this study conducted on patients with CRF, diarrhea was found in 62.5% of the 32 patients who were diagnosed cryptosporidiosis and a statistically significant relation was found between the incidence of this parasitosis and diarrhea ($p < 0.01$). This result suggests that cryptosporidiosis should be considered in diarrheal patients.

In the studies performed on *Cryptosporidium* sp., patient groups usually have insufficient immunity and diarrhea. Diarrhea is the most common symptom in patients with cryptosporidiosis. Diarrhea is a common symptom in studies conducted among patients with AIDS (Kurniawan et al., 2009), cancer (Koturoğlu et al., 2004), diabetes (Dökmetaş et al., 1998), or gastrointestinal complaints (Jokipii et al., 1983). In studies conducted on *Cryptosporidium* sp., diarrheal patients were more frequently considered by researchers (Caprioli et al., 1989; Mata et al., 1984; Mathan et al., 1985; Özçelik et al., 1996). In this study conducted on patients with CRF, diarrhea was found in 62.5% of the 32 patients who had *Cryptosporidium* sp., and a statistically significant correlation was found between the incidence of this parasitosis and diarrhea ($p < 0.01$). This result suggests that cryptosporidiosis should be considered in diarrheal patients.

In this study, constipation was found in 53.1% of the patients who had cryptosporidiosis, and a statistically significant correlation was found between the incidence of parasitosis and constipation ($p < 0.05$). In dialysis patients with cryptosporidiosis, the cause of constipation is thought to be related to impaired bowel motility.

In 32 patients with cryptosporidiosis, complaints such as abdominal pain ($p < 0.01$), nausea ($p < 0.01$), anorexia ($p < 0.01$), headache ($p < 0.01$), cough ($p < 0.01$), respiratory distress ($p < 0.05$), growth retardation ($p = 0.05$) and sleeping salivation ($p < 0.05$) were detected and statistically significant correlations were found between these symptoms and the incidence of cryptosporidiosis. If these symptoms occur in dialysis patients, it is considered that this parasitosis should also be taken into consideration. However, there were no statistically significant correlations between incidence of cyclosporin and income level, education, living conditions, living conditions and habits.

The rate of *C. cayetanensis*, which has a cosmopolitan distribution in the world and in Turkey, is lower than that of *Cryptosporidium* sp. This parasite has been found especially in patients with insufficient immunity. This parasite has been found in 1.1% of 5836 children over 2 years old in Peru (Madico et al., 1997), 4.5% of 318 patients chronic with diarrheic and AIDS in Jakarta, Indonesia (Kurniawan et al., 2009), 1.1% of 90 AIDS patients in Thailand (Saksirisampant et al., 2009), and 5.9% of 136 patients (aged 2-69 and with inadequate immunity) in Riyadh, Saudi Arabia (Al-Megrin, 2010).

Studies on *C. cayetanensis* in Turkey; It has been found in 1.91% of 3925 patients performed from Degirmenci et al. (2007), 0.4% of 554 patients has immunodefected and diarrhea from Aksoy and Tuncay (2007), in three male patients (One of the patients was HIV positive at 40-years-old, the second with hepatic cirrhosis at 52-years-old, and the third with normal immunity at 62-years-old.) from Yazar et al. (2009), in a 50-year-old male patient with kidney transplant from Güçlü Kılbaş et al. (2009). In our study, *C. cayetanensis* was identified in one out of 100 dialysis patients (1%) who examined stool specimens. This case is a 14-year-old girl with diarrhea, occasional constipation, vomiting and headache complaints. The immunity of this patient was suppressed and this case was found to be compatible with the above studies.

Conclusion:-

In conclusion, in this study, opportunistic parasites in dialysis patients, especially *Cryptosporidium* sp. 32%, while *C. cayetanensis* was found only in one of the patients. *Cryptosporidium* sp. is seen to be much higher in diseases which cause suppression of immunity system as seen in CRF, zoonotic character, low number of oocysts having infectious ability, resistance of oocysts to external conditions, resistance to many disinfectant substances, poor sanitation rules, inadequate infrastructure of patients, or living in rural areas, and a low socioeconomic level of local people can lead to a higher prevalence.

Patients with CRF like immunosuppression and weakness of the immune system and having complaints such as diarrhea, abdominal pain, nausea, constipation, loss of appetite have come to the conclusion that opportunistic parasites, especially *Cryptosporidium* sp., should be taken into consideration and routine stool examination should be done routinely. It has also been found that the modified acid-fast staining method is still valuable in the differential diagnosis of *C. cayetanensis* and *Cryptosporidium* sp.

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