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COMPARISON OF THE PREVALENCE OF GASTROINTESTINAL PARASITES IN LORESTAN PROVINCE WITH NORTHERN AND SOUTHERN PROVINCES OF IRAN

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ABSTRACT

Introduction: Despite to health cares and this fact that each of the parasites has their own biological and developmental conditions but parasitic infestations have still remained as an acute health problem. It is expected that Iran with variety of customs, culture and climate- geographical conditions to have different types of parasites of the digestive system in many different regions. The purpose of this study is comparison of the prevalence of gastrointestinal (GI) parasites in the relatively central province of Lorestan with provinces of northern and southern of Iran. **Materials and Methods:** Prevalence of GI parasites in the Lorestan province in the year 2013 were compared with the prevalence of them in the Northern and southern provinces that the results of studies were obtained through the websites such as: google, googlescholar, pubmed, Irindex, Elsevier, scnrceidirect. **Results:** The table shows that trichostrongylus parasite only in the north province is prevalent and the prevalence of strongyloides parasites also in the provinces of the north and south has a significant difference with the Lorestan province ($P < 5\%$), and the other parasites of the digestive system have relatively similar diversity and additionally, fasciolahepatica that its proper biological conditions is in the northern province, sometimes causes an epidemic in Lorestan, too. **Interpretation:** Regarding to the variety of prevalence of GI parasites in different regions of Iran and presence of some of them like trichostrongylus and fasciola in the northern areas and the lack of them in other studied provinces, the expectation regarding to the difference prevalence of them among the provinces and in the comparison with the official mean of the country related to some other such as strongyloides to some extent has been met and it showed that depending on the geographical and climatic conditions of each region, a certain kinds of parasites can grow.

Keywords: Comparison, Gastrointestinal Parasites, Iran, Northern Provinces, Lorestan Province, Southern Province

INTRODUCTION

Despite to health care developemnet, parasitic infestations have still remained as an acute health problem (Montresor *et al.*, 2002). And are considered as the commonest forms of infections causing the gastrointestinal syndroms especially in developing countries (Ashtiani *et al.*, 2005).

Some prasites like amebiasis isas the third causes of parasitic mortality after malaria and schistosomiasis which theycause annually about 40 -100 thousand deaths in the world (Karimizarchi and Mahmoudzadeh, 2002; WHO, 1997; Petri *et al.*, 2000).

World Health Organization (WHO) has estimated that about 3.5 billion people of the world have the GI parasites and of this amount, approximately, 450 Million people which are mostly children are suffering from their existence and 56 million of the infected children have non specific signs such as abdominal pain, nausea, vomiting, loss of appetite, weight loss and Abdominal bloating (6; Niyyati *et al.*, 2009; Escobedo *et al.*, 2009).

Perhaps it can be because of the low level of immune system and more contact with the contaminated soil and materials or lack of Standards primary health which are exposed to these parasitic infestation more than adults. since, the majority of these parasites are entering through the mouth and settling down into digestive system and (Bahadoran *et al.*, 1996) and these infections in patients who have defect in the immune defense system or suffering from malnutrition are dangerous (Bahadoran *et al.*, 1996) and

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annually weekly sums of the budget in developing countries are spent to fight with them and or to treat the diseases related to them (Davami *et al.*, 2002).

Every parasite has its own biological and developmental conditions and its life dependent on them and in the case of providing these conditions its life continues and otherwise it will die, while in many cases they have learned how to adapt themselves to prevalence of gastrointestinal parasites are dependent to beliefs and life style, customs and tradition of the people which they may go under alterations in a time interval, on the other hand, pathogenicity and mortality and harassment caused by parasites of the digestive system are varying from one type to the another type and the other effective factors are considered in the transmission of the parasites are including: changing in social and economical status, climatic conditions and consumption habits of the people (Akhlaghi *et al.*, 2009; Legesse and Berhanu, 2004). For example a reduction in prevalence of parasites to the amount of 0- 3.6 percent in Iran is due to substitution of chemical fertilizers instead of human feces and installation of safe sewage systems, the implementation of the health education plans and proper washing of vegetables before consumption (Anvarian, 2011). Iran which has been located in the east of Iraq, north of Persian Gulf, west of Afghanistan and in south of Caspian Sea has a variety of culture and climatic conditions which caused the variety in prevalence of gastrointestinal parasites in different provinces of it (Davami *et al.*, 2002).

The aim of this reviewing study is the comparison epidemiological prevalence and diversity of parasites of the digestive system in Lorestan province (a province relatively central) with province of the northern and southern of Iran.

MATERIALS AND METHODS

This study was based on the comparison of epidemiological and demographic prevalence of gastrointestinal parasites in the Lorestan province, which has been conducted in the year 2013 in all population of the village and the city and then its results were compared with study results of the Northern and southern provinces of the Iran which have been obtained through the websites of the google, googleschoolar, pubmed, Irindex, Elservier, scncedirect.

RESULTS AND DISCUSSION

Results

In this study, the prevalence of gastrointestinal parasites has been divided into two groups: one of them is a comparison study and is seen in following table and the other as a non-comparison study which is related to those parasites that need special environmental and biological conditions.

type of parasites	Rate of prevalence	giardia	Blastocystis	E. coli	E. histolytica	Endolimax	Iodamoeba	H. nana	Enterobius	Trichostrongylus	Strongyloides
province and percent											
Mazandaran (1)	9.1	¼	1.8	1.2	0.1	0.7	1.3	0.9	0.2	0.4	-
-Mazandaran (2)	33.3	10.6	13.5	7.2	-	1.5	-	-	2.2	2.1	1.6
Gorgan	33.5	18.5	6.9	9.2	-	-	-	3.3	1.7	-	0.8
Lorestan	16.4	6.5	5	2.3	0.7	0.3	0.8	0.15	-	-	0.07
Bandar Abbas (1)	48.8	17.2	24.6	15.9	5.8	-	1.6	-	-	-	-
Bushehr	37.3	2.8	6.9	6.9	0.5	5.9	1.3	1.8	-	-	-
Bandar Abbas (2)	48.5	2.3	7.5	9.8	2.3	-	-	0.8	0.8	-	17.3

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Comparison of the prevalence of gastrointestinal parasites in the Northern and Southern provinces with Lorestan province (Badparva *et al.*, 2014; Vahedi *et al.*, 2012; Kia *et al.*, 2007; Tohidi and Qohani, 2009; Bairami *et al.*, 2011; Shokri *et al.*, 2012; Fouladvand *et al.*, 2014).

The first group except to the parasites of *Trichostrongylus* that are zoonotic parasite and has been only reported in the northern provinces and *Strongyloides stercoralis* which is found in the damp and tropical climate and has been reported in most of the studied provinces but its prevalence in the provinces of north and south had a meaningful difference with Lorestan province with 0.07 value ($P < 5\%$) and in other cases the difference was not noticeable. And in the second group can *Fasciola* zoonoses parasite can be pointed out that within two recent decades has been caused an epidemic in the northern provinces especially in Gilan province (Assmar *et al.*, 1991; Moghaddam *et al.*, 2004).

Interpretation

In the introduction it has been mentioned that life style of people and climatic - geographical conditions of provinces have an influence in prevalence of parasitic infestation (Legesse and Berhanu, 2004; Anvarian, 2011). Lorestan province with an surface area of 2829 km² (as the sixteenth province of the country) and population of 1,075,952 people (based on census of year 2011) has four geographic region as following:

1- mountain region: with the winter snow and cool summer, 2- a valley that city of Khorram Abad (center of the province) is in this area has the warm and a relatively dry summer but in the rest seasons is rainy, meanwhile "Oshtoran" mountain prevent north winds to reach to here, 3- jungle that has been located between the Seimareh River and mountains of Khoram Abad which has the warm summer but because of mass of the trees is relatively moist, 4- tropical area in the south and the southwest of province with a warm summer and mild winter, Additionally, cities of the province such as Khoram Abad with the warm summer and mild winter, Borujerd with the cold winter and moderate summer and Aligudarz with a very cold winter and cool summer have a variety of weather (24) and the rate prevalence of the parasites in the different cities is different; for instance while the prevalence of *Blastocystis* in Borujerd reaches up to 19%, in Aligudarz up to 6% and in Poldokhtar and Azna zero percent has been reported (Badparva *et al.*, 2014; Badparva *et al.*, 2012).

Since the northern provinces that have been located between the Alborz mountain ranges and the Caspian Sea which are mostly covered with the forest and have more rainy seasons and consequently have the higher moisture and the southern provinces which have been placed in tropical and subtropical regions, thereby climatic conditions and geographic regions of the studied provinces are different, consequently it can be also expected to have the variety of parasites.

Following the division of the results of comparison of the parasites prevalence, which have been divided into two groups, a coherent information on the table has been determined that regarding to differences in prevalence of parasites except *Trichostrongylus* Zoonoses which have been reported in most of northern provinces, human cases have not been found in the southern provinces and Lorestan and it may be due to the special climatic conditions has been transmitted from the animals to human (Vahedi *et al.*, 2012; Kia *et al.*, 2007; Tohidi and Qohani, 2009; Bairami *et al.*, 2011; Shokri *et al.*, 2012; Fouladvand *et al.*, 2014) and *Strongyloides stercoralis* that is unique nematodes because firstly "ability of choosing two evolutionary paths freely (in the case of favorable environmental conditions) and a parasite that could be converted to each other. Secondly" in specific conditions like defect of immune defense system causes a spontaneous internal contamination or in mental retard people because of the lack of sanitation and remaining of stool containing larva around anus causes a spontaneous external contamination. that leads to stability and survival of parasite in the body host for decades (Ade, 1996). And its prevalence in those areas where have Moist Soil or improper disposal of waste can reach up to 40% and the highest prevalence of it is in tropical regions (Ade, 1996; Rose, 2008; Sue *et al.*, 2004). Prevalence of this parasite in the province of Gorgan is 0.8% and in three studies in Mazandaran province its rate was of 1.6, zero and the other one which is not listed in the table is 4.9% (Vahedi *et al.*, 2012; Kia *et al.*, 2007; Tohidi and Qohani, 2009). And this amount with using the sensitive diagnostic methods in Lorestan province has been considered 0.07% it means close to zero (Badparva *et al.*, 2014; Badparva *et al.*, 2014). In comparison with the official mean prevalence of country which has announced the prevalence of

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strongyloides up to 0.3% (Rokni, 2003) northern provinces have higher and Lorestan province has a lower rate compare to of the national mean prevalence and in the province of Gilan which has been one of the endemic regions for parasites transmitted via soil since one or two recent decades, with prevention and required controls, now only strongyloides has survived (Rokni, 2003) and in a study conducted in the center of the caring of mental retards in Hormozgan province 17.3% of them were infested with parasites that it could be because of the spontaneous external contamination and or of tropical region (Shokri *et al.*, 2012) as it is considered as the suitable conditions for transmission of the parasites, almost the rest of parasites have been relatively reported in all northern, southern provinces as well as Lorestan province.

The second group are restricted to hepatic trematodes from fasciola species during which its evolution need to a snail from lymnaea species and aquatic plants, human infestation to this parasite has increased during 4 recent decades world widely and 2,400,000 cases have been reported in 61 countries and 180 million people are in danger (Rim, 1994).

This disease became epidemic for the first time in the year 1988 in Gilan one of the northern provinces of Iran and the highest prevalence of human in the world that is about 10000 people were infected and the second epidemic was in the year 1999 in the Bandar Anzali which 2465 people were infected in an extent that in a serological investigation in this area 50% of people had antibodies against the fasciola (Assmar *et al.*, 1991). And in Mazandaran province between the years 1999 to 2002 about 107 cases have been reported infected (Moghaddam *et al.*, 2004).

The reason of this outbreak is considered as high rainfall because it causes an increase in the host snails and the increase in their pathogenicity and consumption of species from local plants (Salahi-moghaddam *et al.*, 2011) for example 90% of infected individuals had history of consumption Kalish (local language) that is a green and fragrant plant and usually contaminated with metacercariae (Khosravi and Bahaahmady, 2012). While sensitive diagnostic methods like PCR also can be the reason (McGarry *et al.*, 2007).

Although different species of fasciola have a similar life cycle but also have differences, for instance fasciola gigantica and fasciola hepatica are more prevalent in downstream and upstream regions and this transmission is due to the prevalence of intermediate hosts (Salahi-moghaddam and Arefaa, 2013). fascioliasis in southern provinces and Lorestan province has not been reported and in attempted studies in Iran it has shown that snails lymnaea truncatula is as one of the intermediate host of which its present in most parts of the country except Bushehr province has been reported (Salahi-moghaddam and Arefaa, 2013) and it can be the reason for the absence of fasciola parasites fasciola in this region.

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