Pattern of visceral leishmaniasis in the province of Fars, Iran (Since 2010-2013)

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ABSTRACT

Visceral Leishmaniasis (VL) is a Zoonotic infection, caused by Leishmania infantum Mediterranean area, including Iran. In the some areas, including: Ardabil, East Azerbaijan, Fars and Blusher provinces are endemic areas and in the other provinces are sporadic areas. Purpose of this study was Pattern of Visceral Leishmaniasis in the Province of Fars, Iran (Since 2010-2013). In this cross-sectional, utilizes retrospective study on visceral Leishmaniasis cases, that were admitted to Fars province, Shiraz, Iran from January 2010 to December 2013. The diagnosis was established on the basis of patient history, clinical examinations and laboratory investigations. p < 0.05 was considered as the significant level. A total of 188 individuals that surveyed, 94 individuals confirmed reported with VL (from January 2010 to December 2013) were studied and 94 individuals with the same demographic but without VL were studies. Among 94 individuals that were infected, 43 (45.7%) were females and 51 (54.3%) were males and the difference was not significant (P=0.469), also age group (P=010), year distribution (P=106) and Season distribution (P=127) the difference was not significant. But according of resident in North or South and resident in rural or urban the difference was significant (P=0.000). Our finding showed no statistically difference between both sexes and it is similar to previous studies. treating infected individuals to decrease the disease’s mortality, eliminating stray dogs, vector control and especially better awareness is required to prevent and eradicate the problem of VL infection from rural communities to control is require.

Keywords: Visceral Leishmaniasis, Iran, Incidence, Fars province.

INTRODUCTION

Visceral Leishmaniasis (VL) also known as kala-azar, caused by Leishmania (Leishmania) Infantum in Mediterranean area and Middle East, including Iran. It is fatal if left untreated and pediatric disease and Almost 99.0% of VL cases were found among children up to 12 years old in the VL endemic areas. Over 90% of visceral Leishmaniasis cases occur in six countries: Bangladesh, Brazil, Ethiopia, India and Sudan. An estimated 200 000 to 400 000 new cases of VL occur worldwide each year (Fig.1). After Malaria, VL is the most severe form of Leishmaniasis, second largest Parasitic killer in the world, the clinical symptoms of VL include prolong fever, fatigue, weight loss, bleeding tendency and an enlarged spleen and liver [1-3]. Mediterranean VL is preventing in Iran, in the some areas, including: Ardabil, East Azerbaijan, Fars and Blusher provinces is endemic areas and in the other provinces is sporadic areas. The causative agent of VL in Iran is Leishmania (L) infantum [MHOM/In/80/DD8] and its man reservoirs are wild and domestic canine. Among those affected by visceral Leishmaniasis, most of the patients are children under the age of 5 years and nearby 99.0% of VL cases were found...
in the VL endemic areas among children up to 12 years old. Although *L. infantum* is the principal agent of human as well as canine VL in Iran, *L. tropica* is the second etiological agent of VL, particularly in immunosuppressed patients. Three heliotypes were recognized in *L. infantum* isolated from domestic dogs [4-7].

Fars Province is one of the thirty-one provinces of Iran and known as the cultural capital of Iran. It is in the south of the country, in Iran's Region and its administrative center is Shiraz. It has an area of 122,400 km². In 2011, this province had a population of 4.59 million people, of which 67.6% were registered as urban dwellers (urban), 32.1% villagers (small town/rural), and 0.3% nomad tribes. Here are three distinct climatic regions in the Fars Province. The average temperature of Shiraz is 16.8 °C, ranging between 4.7 °C and 29.2 °C (Fig. 2). Purpose of this study was Pattern of Visceral Leishmaniasis in the Province of Fars, Iran (Since 2010-2013).

**Fig. 1** The distribution of visceral leishmaniasis, worldwide, 2012
**Fig. 2** Fars province is located in the south of Iran.

![Data source; WHO, 2014](image1)
![Data source; Google, 2015](image2)

**MATERIALS AND METHODS**

In this cross-sectional, utilizes retrospective study on visceral Leishmaniasis cases, who were admitted to Fars province, Shiraz, Iran (from January 2010 to December 2013). The data was obtained from health centers. The following information was obtained for each patient: age, sex, place of residence, year of admission, season of admission and geographical of residence of cases enrolled in the study. The number of cases and controls was same, 175. The diagnosis was established on the basis of patient history, clinical examinations and laboratory investigations. The data 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 Fisher-exact Test. Differences were considered significant at P-values of less than 0.05. Informed consent was taken from patients and parents.

**RESULTS**

A total of 188 individuals that surveyed, 94 individuals confirmed reported with Fascioliasis (from January 2010 to December 2013) were studied and 94 individuals with the same demographic but without VL were studies. Among 94 individuals that were infected, 43 (45.7%) were females and 51 (54.3%) were males and the difference was not significant (P=0.469), according of age group showed that: the highest rates of infection in 3-10 years of age group to VL with 62 cases (63.9%), the lowest rate in >10 years age group to VL with 10 cases (44.2%) and the difference was significant (P=010) (Fig. 3 and Table. 1).
Table 1: Age group distribution of visceral Leishmaniasis

<table>
<thead>
<tr>
<th>Age group</th>
<th>Leishmania (L) infantum</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive N</td>
<td>%</td>
</tr>
<tr>
<td>0-2</td>
<td>22</td>
<td>44.9</td>
</tr>
<tr>
<td>3-10</td>
<td>62</td>
<td>63.9</td>
</tr>
<tr>
<td>&gt;10</td>
<td>10</td>
<td>44.2</td>
</tr>
<tr>
<td>Total</td>
<td>94</td>
<td>54</td>
</tr>
</tbody>
</table>

Table 2: Year distribution of visceral Leishmaniasis

<table>
<thead>
<tr>
<th>Year</th>
<th>Positive N</th>
<th>%</th>
<th>Negative N</th>
<th>%</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>33</td>
<td>62.3</td>
<td>20</td>
<td>37.7</td>
<td>53</td>
<td>100</td>
</tr>
<tr>
<td>2011</td>
<td>12</td>
<td>37.5</td>
<td>20</td>
<td>62.5</td>
<td>32</td>
<td>100</td>
</tr>
<tr>
<td>2012</td>
<td>30</td>
<td>60</td>
<td>20</td>
<td>40</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>2013</td>
<td>19</td>
<td>48.7</td>
<td>20</td>
<td>51.3</td>
<td>29</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>94</td>
<td>100</td>
<td>94</td>
<td>100</td>
<td>188</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 3: Season distribution of visceral Leishmaniasis

<table>
<thead>
<tr>
<th>Season</th>
<th>Positive N</th>
<th>%</th>
<th>Negative N</th>
<th>%</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring</td>
<td>30</td>
<td>51.7</td>
<td>28</td>
<td>48.3</td>
<td>58</td>
<td>100</td>
</tr>
<tr>
<td>Summer</td>
<td>13</td>
<td>50</td>
<td>13</td>
<td>50</td>
<td>26</td>
<td>100</td>
</tr>
<tr>
<td>Autumn</td>
<td>19</td>
<td>44.2</td>
<td>24</td>
<td>55.8</td>
<td>43</td>
<td>100</td>
</tr>
<tr>
<td>Winter</td>
<td>32</td>
<td>68.1</td>
<td>15</td>
<td>31.9</td>
<td>47</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>94</td>
<td>54</td>
<td>80</td>
<td>46</td>
<td>188</td>
<td>100</td>
</tr>
</tbody>
</table>

Prevalence of VL in the Province of Fars, Iran (from January 2010 to December 2013) according of year distribution showed that: the highest rates of infection in the year of 2010 to VL with 33 cases (62.3%), the lowest rate in the year of 2011 to VL with 12 cases (37.5 %) and the difference was not significant (P=0.106), Prevalence of VL in the Province of Fars, Iran (from January 2010 to December 2013) according of Season distribution showed that: the highest rates of infection in winter to VL with 32 cases (68.1%), the lowest rate summer to VL with 13 cases (30 %) and the difference was not significant (P=0.127) (Table 2, 3).
Prevalence of VL in the Province of Fars, Iran (from January 2010 to December 2013) according of Resident in North or South showed that: the highest rates of infection in south to VL with 72 cases (67.9%), the lowest rate north to VL with 22 cases (32.4 %) and the difference was significant (P=0.000). Prevalence of VL in the Province of Fars, Iran (from January 2010 to December 2013) according of Resident in Rural or Urban showed that: the highest rates of infection in rural to VL with 74 cases (65.5%), the lowest rate urban to VL with 20 cases (32.8 %) and the difference was significant (P=127), (Fig. 4, 5).

DISCUSSION

The first case of human VL in Iran was reported by Pouya (1949) in a boy from the Caspian area in northern Iran. Since then, 4300 cases of human VL have been diagnosed in at least 113 cities and districts in Iran throughout the end of 1993, also the average numbers of VL cases have been more than 200 cases per year during the last decade with a decrease in reported cases in recent years. The average annual number of the diagnosed cases of VL in Iran during last decade was 0.449 cases/100,000 inhabitants.

The purpose of this study was to find out the pattern data of admitted Visceral Leishmaniasis cases in a research, also focus on the risk factors contributing to the high rate of infection. In Iran, VL Occurs in two forms, including endemic and sporadic areas. Ardabil, East Azerbaijan, Fars and Boushehr provinces are endemic areas and the other provinces of Iran are sporadic areas [8-9]. Our finding showed no statistically difference between both sexes and it is similar to previous studies, in some rural areas of Iran, the rate of active VL cases in males was higher than females,
but these differences were not statistically significant [10-12]. Previous studies show Up to 99.0% of VL cases were found among children up to 12 years old in the VL endemic areas. 

*L. infantum* is the principal agent of human as well as canine VL in Iran and Comparison of age distribution of this study with the other studies in Iran showed the similar distribution. *L. tropica* is the second etiological agent of VL, in immunosuppressed patients [13-14]. The disease had not different pattern of seasonal distribution and year in this area in comparison to other foci in the country and the samples observed during the year with a few cases in spring (April, May and Jun) while the most cases were reported in springs in other foci [15-16]. It is affecting mainly the poorest section of society, Border cities, villages and deprived areas, considering the place of residence; the majority of cases were from rural followed by sub-urban areas. This pattern was seen in more Provinces of Iran, specially, known endemic foci of disease in the country, similar to our study [17-18].

Higher altitudes are generally characterized by lower temperatures and a lower relative humidity and these indicators have a tendency of greater fluctuations which affect the distribution of the vector negatively. In the lowlands, on the other hand, humans are especially at risk due to widespread situations suitable for the sand fly vector which prefers a relative humidity of 70-80% and temperatures between 25 and 28°C. However, transmission is more focally distributed than in many highland areas since the Breeding sites of the vector are concentrated to spatial locations such as river banks, alluvial soil and dark, damp places such as deep cracks in the soil or rock.

It appears that various weather and humidity conditions in the four distinct established geographical zones could influence serological detection of *L. infantum* infections in both humans and dogs. This is because sand fly activities have been correlated with weather and humidity, our results showed [19-22].

**CONCLUSION**

Although, findings indicate that in recent years the numbers of the cases of diagnosed in this area have increased and the disease is endemic in this province. we suggest eliminating stray dogs, identifying suspect leashed dogs by periodic direct agglutination test and eliminating those found seropositive; vector control, rapid detection of human cases using practical serological tests, treating infected individuals to decrease the disease’s mortality rate and developing public health education especially more better and awareness is required to prevent and eradicate the problem of VL infection from rural communities.

**Acknowledgement**

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**REFERENCES**


