Epidemiology of Human Rabies Deaths in Babylon Province, Five Years Descriptive Epidemiologic Study

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Abstract

Human rabies is a fatal zoonotic diseases, it was endemic in Iraq since 4000 BC, poor passive surveillance and lack of educational awareness of public in Iraq lead to the end emicity and outbreaks of the disease especially in the central governorates including Babylon province. The objective of this study was to evaluate the epidemiologic features and the incidence of deaths of human rabies in Babylon province during the years 2012 to 2016. Nine human rabies deaths were reported during this period. Diagnosis is majorly carried out by clinical presentation coupled with history of exposure to rabies infected dog. This number of human deaths due to rabies gotten from this review is a far cry to the number of human death due to the diseases. This study showed that this disease is endemic in Babylon governorate, an epidemic took place in the province during the year 2016, the victims were mainly males; male to female ratio was 8:1, fatal human rabies affect mainly children and young age males, most of victims didn’t receive post exposure vaccine (88.9%). Human rabies in Babylon province still a public health problem, strategic plan for elimination of human rabies is strongly needed.

Keywords: Epidemiology, Human rabies, deaths, Babylon, Iraq.

Introduction

Rabies is an almost invariably fatal disease that is associated with animal bites [1]. It is important to know about epidemiology of rabies for prevention of human deaths due to rabies and formulation of effective rabies control strategies because rabies is the disease which has many misconceptions, and the general population in developing countries is usually unaware about the consequences of animal bite, Hence, many of them do not seek medical care [2].

Rabies is a zoonotic disease of warm-blooded animals, particularly carnivorous such as dogs, cats, jackals, and wolves. It is transmitted to man usually by bites or licks of rabid animals, [3] dog is the most common biting animal[4,5] The disease is caused by rabies virus, which can infect all mammals and its infection virtually always results in death [6].

The disease is distributed in all of the countries except for Antarctica. Nevertheless, the most of rabies deaths occur in Africa and Asia (95% of global death) [7]. It was found that clear understanding of the epidemiology of rabies in Europe is vital before rabies eliminating programs are established [8]. Despite existing vaccines and post-exposure prophylactic treatment, rabies remains a neglected disease that is poorly controlled throughout much of the developing world [9].

Rabies is a public health problem of significant importance in the majority of Southern and Eastern Mediterranean and Middle Eastern countries. In some of these countries, there is a considerable death rate due to rabies [10].

People especially in developing countries believe in taking single dose of anti-rabies vaccine which is as good as remaining unvaccinated [11]. For example in India the most important factor contributing for such high incidence of human rabies is the lack of community awareness regarding rabies and
its prevention. [12], effective implementation of education and communication strategies has significantly improved the perception of population on rabies and its prevention [13-16]. More investigation into the scale of the burden of rabies in the Middle East and Central Asia is required, where minimal information is available [17].

In Iraq there was a three-fold increase in reported cases between 2003 and 2005 and, although the number of cases has varied from year to year, there has not been less than 15 cases reported per year, since 2005 human rabies incidence was increasing in Iraq [18].

There is regional variation in the number of reported cases, with governorates in the center of the country reporting the highest incidence during 2001–2010[19].

A study of the epidemiology of rabies at the provincial level could be of value, as this would provide more specific and deeper explorations and analyses of the local impact of the epidemic and endemic situation in the district [20].

In 2015, WHO Member States and key partners (including Iraq) set a global goal to achieve zero human deaths from dog transmitted rabies by 2030.[21,22] This surpassed the goals of the WHO roadmap on neglected tropical diseases [23]

Objective
The present study aimed to evaluate five-year incidence of deaths due to human rabies and correlates in Babylon province during the years 2012 to 2016.

Materials and Methods
This is a cross sectional descriptive study which was done to evaluate the epidemiological characteristics of human rabies deaths in Babylon province – Iraq during the period of five years (2012-2016) by reviewing records of communicable diseases units in the primary health department in Babylon Health Directorate after obtaining the approval of health authorities and the committee of health research ethics committee in Babylon Medical College. Data collection was done using the Time Place Person descriptive epidemiologic model to identify the time trend of the occurrence of human rabies deaths, the distribution of dead cases of rabies by districts in Babylon province and the demographic characteristics of rabies victims during the study period. Data collection from the health passive surveillance system in the department was done which took about two months; data from the veterinary local authority was also used for checkup. Statistical analysis was carried out using SPSS version 20. Categorical variables were presented as frequencies and percentages. Continuous variables were presented as (Means ± SD). Pearson’s chi square (X2) and Fisher-exact test were used to find the association between categorical variables. A p-value of ≤ 0.05 was considered as significant.

Results
Table (1) shows the demographic characteristics and frequency distribution of rabies dead cases during the years 2012-2016 by mean age of cases (15.33 years) explaining that the victims are young ,this table also reveals that males are predominance the male to female ratio is 8:1 and the difference between genders is highly significant p<0.001.

Table (2) explains the occurrence of human rabies deaths according to districts of the province the city center has the highest proportion of cases. Figure (1) shows the distribution of patients with rabies according to year of reporting by Babylon public health department. Among studied patients the majority of human rabies victims (5 cases) were recorded during 2016 indicating an epidemic of the fatal disease in this year. Figure 2 shows the distribution of patients with Rabies according to post exposure prophylaxis (vaccine use). Among studied patients majority 88.9% (8 cases) never take any dose of vaccine.

Table 1: Distribution of rabies cases according to sociodemographic characteristics

<table>
<thead>
<tr>
<th>Variables</th>
<th>mean and SD* years</th>
<th>age range (year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>15.33 ± 13.43</td>
<td>4-46</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>8</td>
<td>88.9%</td>
</tr>
<tr>
<td>Female</td>
<td>1</td>
<td>11.1%</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Male to Female ratio = 8:1

\[df= 1 \quad p < 0.001\]

Standard Deviation
Table 2: Distribution of rabies cases according to places of occurrence during five years in Babylon districts

<table>
<thead>
<tr>
<th>Places of residence</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>City center</td>
<td>6</td>
<td>66.7%</td>
</tr>
<tr>
<td>Hashmia</td>
<td>1</td>
<td>11.1%</td>
</tr>
<tr>
<td>Mahawel</td>
<td>1</td>
<td>11.1%</td>
</tr>
<tr>
<td>Musaiab</td>
<td>1</td>
<td>11.1%</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Discussion

A proper understanding of the epidemiology and impact of rabies is crucial for planning, implementing and evaluating rabies control programs.

Although rabies is modifiable in many countries including Iraq, surveillance is often weak and official reporting of disease remains inadequate and incomplete [24]. It is increasingly accepted that the available data underestimate the true incidence of this fatal disease [25]. World Health Organization put the updated global map showing endemcity of dog-transmitted human rabies at a national level. The limitation of this map is that the classification is at country level and not at sub-national administrative levels, thus the map does not portray sub national details [26-28].
Publications about human rabies in Iraq is very limited [19], this study reveals that there is an epidemic of rabies in Babylon province due to unexpected increase in incidence of human rabies in the year 2016 as compared to the previous four years[29], this may be related to the high number of stray dogs population due to weak stray dogs killing campaigns implemented in the province because of the arm conflict and in security situation, inadequate financial support, lack of cooperation between different sectors concerned with the control of this serious public health problem such as local veterinary and health authorities, private sectors and None Governmental Organization in addition to poor environmental and municipality activities that reflect the increasing amount of untreated garbage waste in the city which provide suitable places for stray dog breeding, the incidence of human rabies in Babylon province during the year 2016 is five times higher than the previous four years and constituted about one third of the total cases reported at the national level which account an average of 15 cases per year [18,19], Babylon province populated about 2 million which constituted 5.5% from the total Iraqi population during the year 2016 but the incidence deaths of human rabies reported by Babylon public health department during the year 2016 was (5 cases) which constituted 33.3% from the average annual number of reported human rabies cases in Iraq [19], this finding put Babylon province among the highest human rabies endemic and epidemic district in Iraq, in Scandinavian countries and the majority of Latin American countries human rabies has been eliminated with zero cases reported, other Asian countries have succeeded to eliminate this fatal disease such as Japan, Malaysia and in certain areas in Philippine after implementation of successful control programs, recently Bangladesh had succeeded to reduce the human dog mediated rabies deaths by 50% between 2010-2013 [30] in Tanzania, Pemba province; elimination of human rabies with zero cases of dog rabies was reported since2014[31].

Regarding the situation of human rabies deaths in the Middle East Region no single case was reported especially in the gulf countries (Kuwait, Bahrain, United Arab Emirate, Qatar and Oman) and Jordan during the last years, human rabies is reportable in Saudi Arabia but no case of human rabies has been reported from this country over recent decades [32,33]. In many countries reports on human death due to rabies infection are low as a result of great under-reporting due to cultural beliefs, poor or inadequate rabies diagnostic units and poor knowledge on the mode of transmission and prevention of the disease [34]. Under-reporting of human rabies in endemic countries has led to the disease being neglected by relevant health care facilities and subsequently poor assistance from international community and donor agencies [35].

Active surveillance researches demonstrated a high level of under reporting by passive surveillance systems. Active surveillance is likely to produce the best available estimates of human rabies deaths [36]. In the current study most of victims are males this finding is similar to the findings of others [37]. Regarding the demographic characteristics of victims our study shows that the disease affect mainly young males this findings goes in line with the findings of other reporters [38] but in contrast to the age distribution in other countries, human rabies was most commonly reported in individuals between the ages of 40 and 65 years in Zhejiang Province-China [39,40]. In conclusion the study revealed that there is an epidemic of human rabies and confirmed that rabies is an endemic fatal disease in Babylon province.

There is need for local and national rabies control programs that will be planned and executed jointly by different sectors; this should involve both the mass media and relevant health care authorities.

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Year Epidemiological Study of Animal Bites and Rabies in Hamedan Province of Iran


