

Evaluation of incidence and spatial distribution of *hydatidosis* in Iran by using of geographical information system (GIS) and quantifying burden of the disease (DALYs) in 2018

Abstract

Introduction: Hydatidosis leads to significant economic losses due to medical treatment costs, disease complications, disease, life disorders and mortality in human cases.

So far in Iran, which is an endemic region of hydatidosis, a comprehensive control program that seems necessary and urgent has not been implemented. In order to implement a sustainable hydatidosis control program, studies are needed to assess transmission factors and risk factors locally. The present study was conducted to investigate the incidence and spatial distribution of hydatidosis in Iran using Geographic Information System (GIS) and disease assessment (DALYs) in 2018

Method:

Recorded data on hydatidosis were collected from the Ministry of Health, the Centers for Disease Control, and published articles on the disease in the country. Livestock information was also collected from recorded information on hydatid cysts in livestock, the National Veterinary Organization. The trend incidence of hydatidosis in Iran was investigated. Spatial analysis of ArcGIS10.5 software was used to investigate the spatial distribution of hydatidosis, to produce spatial distribution maps of the disease and to determine the hot spots of the disease in Iran. Finally, for the correlation between temperature, relative humidity, vegetation density and the incidence of hydatidosis during 2009 to 2018, geographical weight regression analysis was used in ArcGIS10.5. The Disability Adjusted Life years index was also used to calculate the disease burden. Data analysis was performed by SPSS21 software using descriptive statistics, chi-square test.

Results:

Based on the findings of this study, the burden of hydatidosis is 1210.12 years (which is YLD or the burden of disability is 177.12 years or the burden of premature death is YLL is 1033 years) and the rate is 700.22 years for men and 509.89 years for women. The years of life lost in men were longer than women .

The lowest Disability Adjusted Life years in men was in the age group of 69-60 years and the highest was in the age group of 45-59 years.

In women, the lowest Disability Adjusted Life years was observed in the age group of 5-14 years and the highest amount was observed in the age group of 30-44 years. YLD or years spent with disability, or in other words, the burden of disability in men was 78.228 years and in women 98.892 years and in both females and males was calculated 17.12 years. The burden of disability or YLD was significantly higher in women than in men.

In this study, hotspot of hydatid cyst were in Zanjan, Khorasan Razavi, Chaharmahal Bakhtiari, Hamedan and Semnan, North Khorasan and Ardabil provinces. The results of geographical weight regression analysis showed that during the years 2009 to 1397 in Zanjan, North Khorasan, Khorasan Razavi, Chaharmahal Bakhtiari, Ilam, Semnan, Hamadan, Qazvin, Ardabil provinces, the highest correlation between temperature and the incidence of hydatidosis was seen. The highest correlation between temperature, relative humidity, vegetation density and the incidence of hydatidosis was seen.

Conclusion:

The findings of this study show that the use of maps can provide reliable estimates of at-risk populations. Climatic factors of temperature, humidity, vegetation density have a greater impact on the probability of hydatidosis. These factors can be an indicator used to predict the presence of disease. Environmental and climatic factors can be significantly associated with echinococcosis. If further studies show exactly which variables are most influential on the disease, the presence of the disease in these areas can be predicted and the outbreak of the disease can be prevented. Also, if data is recorded and made available at smaller geographical levels, such as counties and counties, it will be more accurate to predict the likelihood of an outbreak. Also, the burden of disease has a fundamental and important effect on the economy of our country. Therefore, disease prevention and control programs seem necessary. One of the keys to solving this problem is to raise the level of awareness of different segments of society about the disease, its causes and how to prevent the disease. Also, the production of healthy agricultural products and livestock is one of the main points of disease control.

Keywords:

Disability Adjusted Life years; Hydatidosis ; Incidence; Environmental variables; Geographical Information System

