Trends of echinococcosis and its radiological studies in China

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Abstract

Objective: The aim of this study is to describe the incidence and mortality of echinococcosis in China, as well as its radiological studies.

Materials and methods: Based on the official high-quality data summarised by Chinese Ministry of Health and reported annually in Chinese Health Yearbook, the authors analysed data about echinococcosis from 2011 to 2015 to indicate its incidence and mortality in China. A statistic analysis based on the available literature from the last century to the middle of 2015 was carried out, so as to learn the radiological research tendency.

Results: There are thousands of cases reported each year from 2011 to 2015, with the most of 3841 cases in 2013 and the least of 2909 cases in 2011. Generally, the radiological studies on echinococcosis showed a fluctuant increasing trend from 1975 to 2015.

Conclusions: Such prompting statistics emphasize the dynamic nature of echinococcosis which needs continuously public concern and enhancing the radiological research direction about echinococcosis.

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Keywords: Radiology; Echinococcosis; Literature analysis

1. Introduction

Echinococcosis, also termed as hydatidosis or echinococcal disease, is a parasitic disease caused by larval stages (metacestodes) of cestode species of the genus Echinococcus [1]. Cystic echinococcosis and alveolar echinococcosis which are caused by Echinococcus granulosus and E. multilocularis respectively are the two main types of the echinococcosis, while polycystic echinococcosis and unicystic echinococcosis are the less forms. There are always no symptoms in the initial period of the disease which may last for years. The symptoms and signs generally rely on the cyst's location and size [2].

Echinococcosis is a neglected tropical disease of substantial morbidity and mortality in most of the world, including parts of Europe, North America, South America and China [3]. The disease is spread when food or water that contains the eggs of the parasite is eaten or by close contact with an infected animal. Ultrasound, computer tomography (CT) or magnetic resonance imaging (MRI) are all effective diagnostic technologies [2,4].

To better understand the trends and radiological research status of echinococcosis in China, incidence and mortality of echinococcosis from 2011 to 2015 were analysed, and the previous radiological studies on echinococcosis were intensively investigated.

2. Materials and methods

2.1. Sources of incidence and mortality data

Echinococcosis is one of the notifiable infectious diseases in China. Echinococcosis data were obtained from the surveillance systems for infectious diseases in China which are mainly hospital based. All hospitals and clinics are obliged to...
report both suspected and confirmed cases of echinococcosis to their nominated county Centre for Disease Control (CDC). Then, county CDCs send the information to the country's central CDC, through the National Infectious Diseases Monitoring Information System Database [5].

2.2. Sources of radiological data

All the available radiological literature related to echinococcosis in the research literature in China were retrieved and analysed under the cooperation with the Medical Library of Chinese PLA. The annual quantity of available papers and the top institutes who contribute to more radiological studies on echinococcosis were summarized.

3. Results

3.1. Incidence and mortality of echinococcosis from 2011 to 2015

According to the data reported in CDC, the five years' statistic was showed in Fig 1. It reveals that there are thousands of cases reported each year from 2011 to 2015, with the most of 3841 cases in 2013 and the least of 2909 cases in 2011. Due to that China is a populous country owning more than 1.3 billion people, the annual incidence from 2011 to 2015 of echinococcosis seems very little. Additionally, no patient was dead of echinococcosis in 2011 and 2014, while only one patient died in 2012, 2013 and 2015 respectively.

3.2. Radiological data on echinococcosis from 1975 to 2015

With the development of medical imaging these years and its effectiveness in diagnosing echinococcosis, more and more attentions have been paid to the radiological studies by researchers in this field. Under the cooperation with the Medical Library of Chinese PLA, the literature quantities on radiological study of echinococcosis were retrieved and analysed. The literature quantities from 1975 to the middle of 2015 were showed in Fig 2. Because of some unexpected limitations, not all the data was collected in 2015. In general, the radiological studies on echinococcosis showed a fluctuant increasing trend from 1975 to 2015. Till 2010, the number of papers reached to the top of 117.

Based on the abovementioned data, the 19 institutions in China who published more than 9 papers totally from 1975 to the middle of 2015 were listed in Fig 3. Obviously, most of the institutions are from Xinjiang province and Qinghai Province. The First Affiliated Hospital of Xinjiang Medical University contributed the most (145 papers) in China.

4. Discussion and conclusion

4.1. Prevention and control of echinococcosis in China

Echinococcosis is epidemic in China, especially in the alpine meadow area and cold region, such as Xinjiang, Qinghai, Tibet, Sichuan and so on. Cystic echinococcosis and polycystic echinococcosis are the two common types in China, and cystic echinococcosis may occupy no less than 90% in all the patients with echinococcosis [6]. Although the annual incidence rate of echinococcosis is very little in China because of the large population, the annual quantity of cases should not be neglected for its high infectivity. Farmers and herdsmen could prevent infection by developing good life habits and doing well in management of domestic dogs and sick animals visceral [7]. For some of the patients are always no symptoms in the initial period of the disease which may last for years, in general, no clinical treatment was given to these patients. However, for some serious patients such as patients with oversize hydatidoma or patients accompanied with other infections, surgical procedure will be a good option [4]. Whatever, cut off the endless chain of possible hydatid infection should earn enough attention.

The highest prevalence rates of cystic echinococcosis are recorded in South America, Northern and Eastern Africa, Eurasia and Australia [8,9], rather than in China. However, prevention and control of echinococcosis in China will have a positive significance to global health.

4.2. The role of radiological technology on diagnosis of echinococcosis

The diagnosis of echinococcosis is mainly based on epidemiologic data, clinical findings, radiological imaging, and serology [2,4]. Radiological measurements are good tools
and play a key role in the diagnosis and assessment of echinococcosis. For most patients with pulmonary cysts, plain chest x-ray was set as one optional diagnosis method. Ultrasonography, as the cornerstone of diagnosis of echinococcosis, is effective in describing the cystic structures and the presence of complications, especially in chest and abdominal locations, such as liver and lung diseases [10,11]. CT and MRI seem to be the most sensitive and accurate examinations, and they both can be used in subdiaphragmatic region, disseminated disease, extra-abdominal region, complicated cysts and pre-surgical evaluation. These two techniques are characterized by achieving not only the structures of lesions but also the accurate staging of echinococcosis. According to a retrospective analysis of patients with abdominal CE cysts who underwent CT, MRI and US imaging, it is concluded that ultrasound remains the cornerstone of diagnosis, staging and follow up of CE cysts. MRI reproduces the ultrasound-defined features of CE better than CT. By contrast, MRI should be preferred to CT due to better visualization of liquid areas within the matrix [2,4].

In summary, such prompting statistic would definitely emphasize the dynamic nature of echinococcosis in China. Early diagnosis and prevention of echinococcosis need continuously public concern. Furthermore, radiological technology, as one of the effective diagnostic measurements, should be emphasized in clinical practice of echinococcosis.

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