

Seroepidemiology of Hydatid Cyst in Chaharmahal va Bakhtiari Province, Iran.

*H Yousefi Darani¹, M Avijgan², K Karimi³, K Manouchehri³, J Masood⁴

¹ Dept. of Parasitology, Faculty of Medicine, Shahrekord University of Medical Sciences, Iran

² Section. of Infectious Disease, Ayatollah Kashani hospital, Shahrekord, Iran

³ Section. of Parasitology, Faculty of Medicine, Shahrekord, Iran

⁴ Dept. of Parasitology, School of Public Health, Tehran University of Medical Sciences, Iran

Abstract

Hydatid cyst is the larval stage of the cestode worm *Echinococcus granulosus*, which causes echinococcosis in human and some other mammalian. Iran is located in endemic zone of this disease and Chaharmahal va Bakhtiari province, due to existence of sheep husbandry jobs, has a potential for high prevalence of the disease. Therefore, this investigation was carried out to study seroepidemiology of hydatid cyst in human in this area. In this descriptive study, 1000 serum samples from blood donors and 1524 from patients referred to clinical laboratories of the province, were subjected to immunoelectrophoresis to detect seropositive cases for hydatid cyst. The prevalence of hydatid cyst in sample population (2524) were 4.8 percent. The infection rate of the disease among males and females was 4.4% and 5.1% respectively. Lordegan city had the highest rate of the infection while Ardal city had the lowest one. Blood donors had a lower infection rate compared with patients referred to clinical laboratories. The results of this investigation revealed that there was a major difference between the prevalence of hydatid cyst in Chaharmahal va Bakhtiari and that of some other parts of the world.

Keywords: Seroepidemiology, Hydatid Cyst, Iran

Introduction

Hydatid cyst is the larval stage of the cestode worm *Echinococcus granulosus* that located in human and some other mammalian tissues, especially liver and lungs and causes echinococcosis. Iran is an important endemic focus of cystic hydatid disease (1). Investigations on echinococcosis, which have been, performed in this country showed the presence of infection among dogs (2-5), livestock (6-8) and man (9-14). In this context results of a recent study in western Iran showed that 19.1% of dogs and 11.1% of sheep had been infected with *Echinococcus granulosus* and hydatid cyst respectively (5). Chaharmahal va Bakhtiari province of Iran has the potential of high prevalence of this disease due to existence of sheep husbandry jobs and presence of numerous stray dogs. Therefore this study was performed to detect the seroepidemiology of hydatid cyst in this area.

Materials and Methods

In this descriptive investigation, study population consisted of male and female patients in all ages referred to clinical laboratories and blood donors between October 2000 and April 2001 in Chaharmahal va bakhtiari province of Iran. Thirty labs out of 201 were screened randomly and then according to the population serviced by each lab, 20-100 spare serum samples were collected from every individual lab up to entire 1524 cases. Three out of those 30 labs were hospital laboratories. One thousand spare serum samples were also collected

from voluntary blood donors referring to Shahrekord Blood Bank station. In all 2524 cases the serum sample volume for every patient or blood donor was one milliliter. All of the serum samples were transferred to Medical School lab in Shahrekord considering cold chain and then they were subjected to counter immunoelectrophoresis according to the method described earlier (15). It has been shown that this method has sensitivity of 95.5% and specificity of 99.2% for hydatid cyst diagnosis (16). Hydatid cyst fluids were obtained from local slaughter houses and hydatid fluid was aspirated from fertile cysts. The hydatid fluid was then centrifuged at 1000g for 15 minutes and the supernatant was aliquoted in small tubes and stored in freezer as antigen. All the sera were used in neat concentration in this work. The data was analyzed statically using t. test.

Results

In this study 1271 cases out of 2524 (50.24%) were male and the other, 1246 (49.6%) were female. Hundred and twenty (4.8%) out of 2524 cases were seropositive for hydatid cyst. Fifty six out of 120 seropositive cases (4.4%) were male and the other 64 (5.1%) were female. The highest rate of infection was found in Lordegan city while the lowest rate was from Ardal City (Table 1). The infection rate of hospitalized patients was 7.1%, which was higher than that of total study population (4.8%). Finally 33 out of 1000 (3.3%) of blood donors were seropositive for hydatid cyst.

Table 1: Seroepidemiology of hydatid cyst among 1524 patients referred to clinical laboratories and 1000 blood donors in Chaharmahal va Bakhtiari province of Iran according to the place of investigation.

Place of investigation	Sample population size	Seropositive cases number and percent
Shahrekord	582	15 (2.6%)
Borujen	110	16 (14.5%)
Ardal	268	5 (1.9%)
Lordegan	108	19 (17.6%)
Farsan	50	3 (6%)
Blood bank	1000	33 (3.3%)
Hospitalized patients	406	29 (7.1%)
Total	2524	120

Discussion

In this research the seroepidemiology of hydatid cyst in 2524 cases of patients referred to clinical laboratories and blood donors in Chaharmahal va Bakhtiari province of Iran was investigated. According to data achieved from this study, prevalence of infection was 4.8%. There was not a significant statistical difference between infection rate of males and females whereas a marked difference of infection rate was found among different places of the province ($P < 0.05$). Previous works about prevalence of hydatid cyst of man in Iran was mainly limited to reports of surgical cases (9-14). In Jordan in 1994 the prevalence of infection was 2.4% and 5.8% among normal population and hospitalized patients respectively (17). In another study in Argentina, 22 out of 497 (4.4%) cases from rural area of Argentina were seropositive for hydatid cyst (18). According to the above data it seems that the prevalence of the hydatid cyst in Chaharmahal va Bakhtiari province of Iran is higher than that of some other parts of the world. The prevalence of hydatid cyst among blood donors was 3.3%, which was lower than the prevalence of the infection in whole sample population. This may be due to this fact that blood donors were normal people while the other investigated cases were patients. In this context Gottstein et al, (19) showed that 0.1% out of 17166 blood donors in Switzerland was seropositive for alveolar echinococcosis. Hospitalized patients had a higher prevalence of infection (7.1%) compared with the rate of seropositivity among entire sample population (4.8%). This result is in agreement with what Moosa found in Jordan (17). Finally further work in some area especially in Lordegan which 17.6% of sample study was seropositive for hydatid cyst is recommended to investigate about risk factors of the infection.

Acknowledgement

This work was supported financially by Shahrekord University of Medical Sciences.

References

1. Harandi MF, Hobbs RP, Adams PJ, Mobedi I, Morgan-Ryan UM, Thompson RC (2002). Molecular and morphological characterization of *Echinococcus granulosus* of human and animal origin in Iran. *Parasitology*, 125 (pt 4): 367-73.
2. Maleky F, Moradkhan M (2000). Echinococcosis in stray dogs of Tehran Iran. *Ann Trop Med Parasitol*, 94(4): 329-31.
3. Mehrabani D, Oryan A, Sadjjadi SM (1999). Prevalence of *Echinococcus granulosus* infection in stray dogs and herbivores in Shiraz, Iran. *Vet Parasitol*, 86(3): 217-20.
4. Eslami A, Hosseini SH (1998). *Echinococcus granulosus* infection of farm dogs of Iran. *Parasitol Res*, 84(3): 205-7.
5. Dalimi A, Motamedi G, Hosseini M, Mohammadian B, Malaki H, Ghamari Z (2002). Echinococcosis / hydatidosis in western Iran. *Vet Parasitol*, 105 (2):161-71.
6. Hosseini SH, Eslami A (1998). Morphological and developmental characteristics of *Echinococcus granulosus* derived from sheep, cattle and camels in Iran. *J Helminthol*, 72(4): 337-41.
7. Oryan A, Moghadar N, Gaur SN (1994). Metacestodes of sheep with special reference to their epidemiological status, pathogenesis and economic implications in Fars province, Iran. *Vet Parasitol*, 51 (3-4):231-40.
8. Motakef M, Minou AA, Lari MM (1976). An epidemiological approach to the study of Echinococcosis in North-East region of Iran (Khorassan). *Pahlavi Med J*, 7(14): 503-15.
9. Bastani B, Dehdashti F (1995). Hepatic hydatid disease in Iran with review of the literature. *Mt Sinai J Med*, 62(1): 62-9.
10. Kelsey DS, Shaffner LS (1984). Pulmonary echinococcosis: the geographic history scores again. *NC Med J*, 45(4):218-19.

11. Panahi F, *Costal echinococcosis* (1978). Report of a case and review of the literature. *Sem Hop*, 8-15 (43-44):1389-92.
12. Lomheh F (1997) Immunofluorescence in the serodiagnosis of human hydatidosis. *Acta Med Iran*, 20(1-2):27-35.
13. Sabbaghian H, Hoghochi N, Ghaderian E (1975). A survey on the prevalence of echinococcosis in Shahrkord Iran. *Bull Soc Pathol Exot Filials* Nov, 68(6): 547-47.
14. Nasseh GA, Khadivi B (1975). Epidemiological and clinical aspects of echinococcosis in east Iran. *J Trop Med Hyg*, 78(6): 120-22.
15. Nagaty HF, Tabatestani M (1979). Evaluation of the counter-immunoelectrophoresis and agar gel diffusion techniques in the diagnosis of hydatidosis in Iran. *Trans R Soc Trop Med Hyg*, 73(6): 720-21.
16. Hira PR, Shweiki HM, Siboo R, Behbehani K (1987). Counterimmunoelectrophoresis using an arc 5 antigen for the rapid diagnosis of hydatidosis and comparison with indirect hemagglutination test. *Am J Trop Med Hyg*, 36(3):592-97.
17. Moosa RA, Abdel-Hafez SK (1994). Serodiagnosis and seroepidemiology of human unilocular hydatidosis in Jordan. *Parasitol Res*, 80(8): 664-71.
18. Coltroti E, Guarnera E, Larrieu E, Santillan G, Aquino A (1998). Seroepidemiology of human hydatidosis: use of dried blood samples on filter paper. *Trans R Soc Trop Med Hyg*, 82(4):607-10.
19. Gottstein B, Lengeler C, Bachman P, Hagemann P, Kocher P, Brossard M, Witassek F, Eckert J (1987). Sero-epidemiological survey for alveolar echinococcosis of blood donors in an endemic area of Switzerland. *Trans R Soc Trop Med Hyg*, 81(6): 960-64.