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EPIDEMIOLOGICAL PROFILE OF HYDATIDOSIS AT THE REGIONAL HOSPITAL CENTER OF THE CITY OF MEKNES (MOROCCO)

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SUMMARY

Objective: The objective of this work is to study the epidemiological profile of hydatidosis at the Regional Hospital Center of Meknes (Morocco). **Methods**: This is a retrospective eye descriptive study of hydatidose cases treated at the Mohammed V Regional Hospital Center in the city in Meknes, over an eight-year period from January 1, 2009 to December 31, 2016. The health data were collected from the registers of the Department of Infrastructure and Provincial Ambulatory Actions (SIAAP) of the Meknes Health delegation. **Results**: 322 cases of hydatidosis were collected, for an annual average of 54 cases. The average annual incidence recorded in the Meknes Prefecture was 4.07 per 100,000 inhabitants. Women (62.11%) were more affected than men (37.88%), with a sex ratio (F/M) of 1.63. The age group most frequently involved was 20-39 years old (43.78%). The liver was the organ most commonly infected (96.27% of cases), followed by the lungs (2.48%) and the kidneys (1.24%). 52. 79% of cases were from urban areas and 47.22% from rural settings. 98.44% of patients were operated and treated with PAIR and 1.56% of cases received medical treatment. **Conclusion**: Echinococcosis represents both a health and socio-economic problem for families and the care structures that receive them. The incidence, location, evolution and severity of this parasitosis should encourage us to pursue research on this subject in order to find the most plausible solutions to reduce its negative repercussions.

KEYWORDS: Hydatidosis; echinococcosis; epidemiology; parasitosis; Meknes.

INTRODUCTION

Hydatidosis (hydatid cyst or hydatid echinococcosis) is a cosmopolitan anthropozonosis due to the development of the larval form of the dog tapeworm Echinococcus granulosus or echinococcal taenia.[1]

Hydatid cysts represent a real health and socio-economic problem for families and health care facilities.[2,3,4,5] The annual economic losses due to this cestode worldwide have been estimated at $193. 529. 740 in humans.[6]

Hydatid cysts can be located in the liver, lungs, heart, brain, spinal cord, bone, pancreas, and other organs (kidneys, pleura or peritoneum, spleen, subcutaneous soft tissues and muscles, thyroid, ovaries, and joints).

Globally, the main foci of hydatid echinococcosis are around the Mediterranean (North Africa, Middle East and Southern Europe), South America, New Zealand and Central Asia.[7]

In Morocco, the Regions most affected by hydatidosis are Meknes-Tafilalet, Chaouia-Ouardigha and Doukkala-Abda.[3]

The objective of this work is to investigate the epidemiological profile of hydatidosis at the Mohammed V Regional Hospital Center in Meknes city.

METHODS

This is a retrospective and descriptive study of hydatidose cases treated at the Regional Hospital Center of Meknes city, over a period of eight years (1st January 2009 to December 31 St, 2016). The health data were collected from the registers of the infrastructure service and provincial ambulatory actions (SIAAP) of the Meknes health delegation. The data collected were entered and analyzed using Microsoft Excel 2010.

The prefecture of Meknes is located in north-central Morocco (**Fig.1**). The climate is of Mediterranean type, influenced by the Middle Atlas Mountains and the Atlantic Ocean. The prefecture had 835 695 inhabitants in 2014.

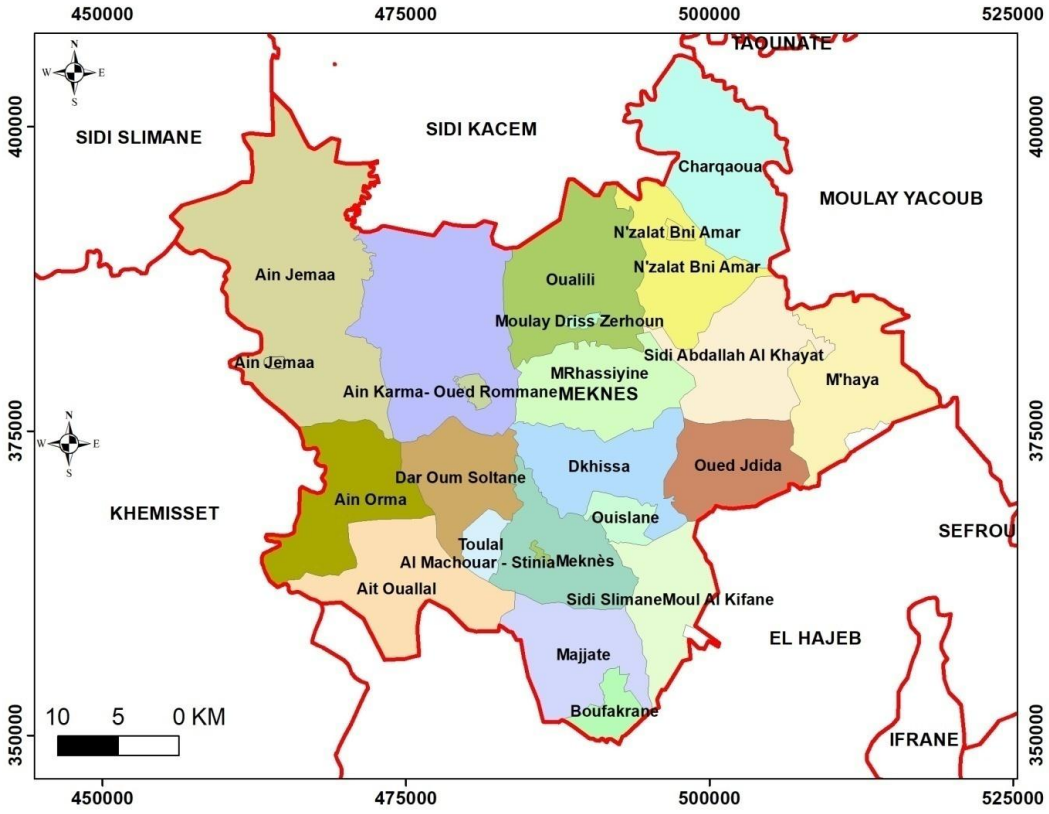

Figure 1: Geographical location of the Prefecture of Meknes.

RESULTS

From 2009 to 2016, 322 cases of hydatidosis were treated at the Regional Hospital Center of Meknes, an annual average of 54 cases. The average annual incidence in Meknes Prefecture was 4.07 cases per 100,000 inhabitants. Females were more affected than males over the study period (**Fig.2**). Thus, 200 cases were recorded among women (62.11%) compared to 122 among men (37.88%) ($p < 0,001$). The sex ratio (F/M) was 1.63 in favor of the female sex.

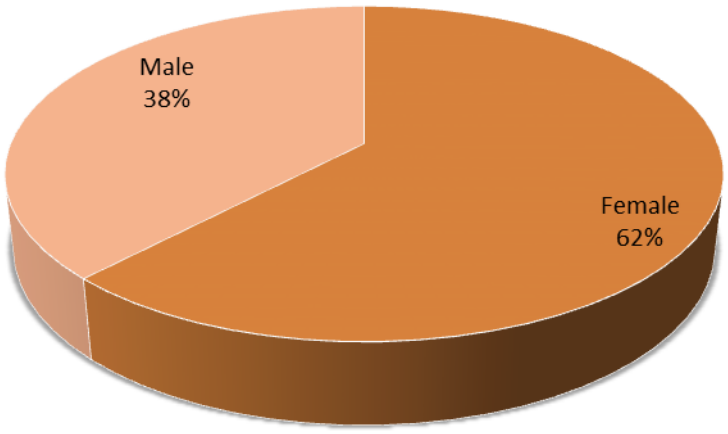

Figure 2: Distribution of hydatidosis cases by sex.

The most representative age group was the 20-39 year-old age group, accounting for 43.78 percent of recorded cases, followed by the 40-59 year-old age group at 27.01 percent ($p < 0,001$) (**Fig. 3**).

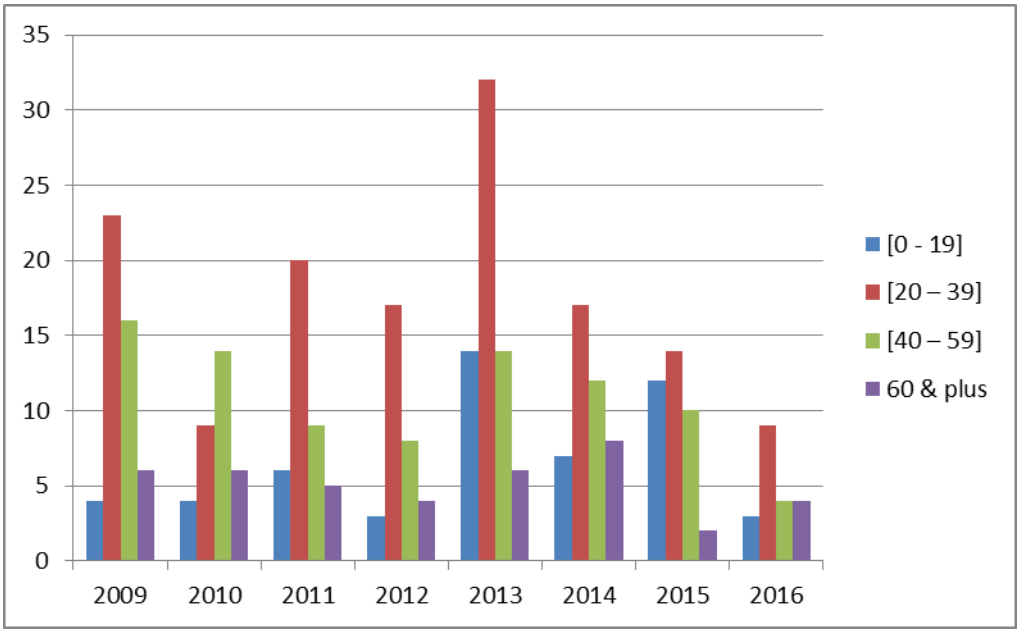

Figure 3: Distribution of hydatid cyst cases by age group.

The distribution of cases by affected organ shows that the liver, lungs and Kidneys were the locations the most commonly infected by parasitosis with 96.27%, 2.48% and 1.24% respectively (p < 0,001) (**Fig. 4**).

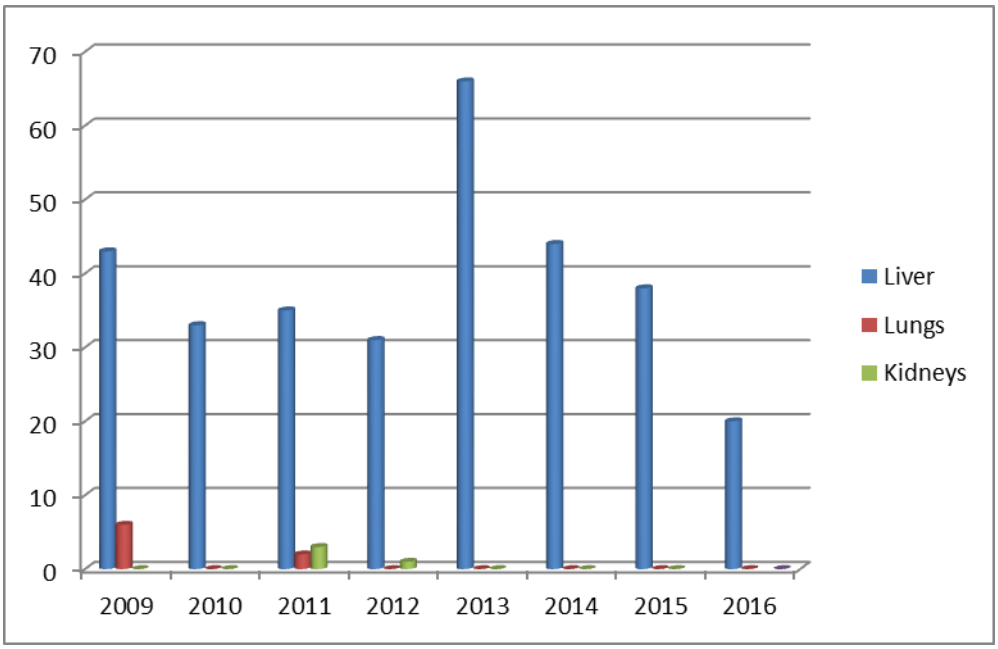

Figure 4: Distribution of hydatidose cases according to location.

The breakdown of hydatidose cases by place of residence demonstrates that 52.79% of cases were from urban municipalities and 47.22% from the rural communes, see figure 5. Eighty point seventy-four percent of the patients originated from the Meknes Prefecture and 19.26% were from extra-provincial municipalities (p < 0,001) (**Fig. 6**).

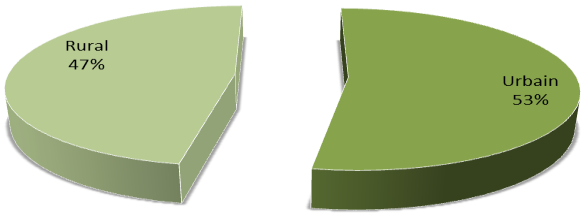

Figure 5: Distribution of hydatidose cases by residence setting.

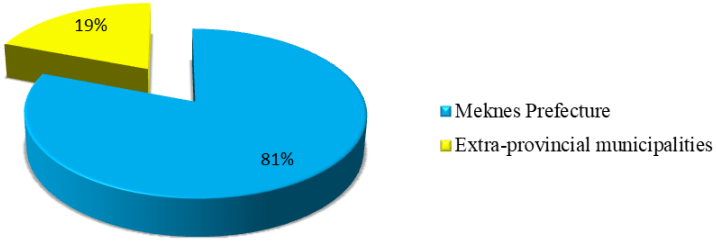

Figure 6: Distribution of hydatidose cases by prefecture of attachment.

During the study period, 260 cases of hydatid cyst were reported in the Meknes prefecture, with an average annual incidence of 4.07 per 100,000 inhabitants. Looking at the number of recorded cases, it appears that the municipalities that registered the highest number of cases are: Meknes, Ouislane, Moulay Driss and Oued Jdida, respectively 141, 20, 19 and 14 cases (**Fig. 7**).

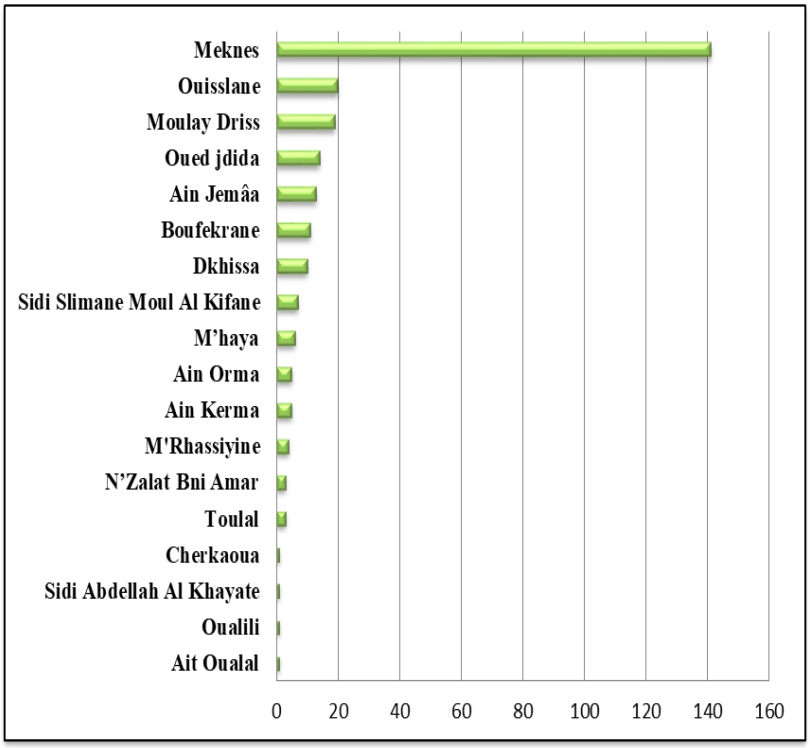

Figure 7: Breakdown of hydatidose cases by municipality.

The distribution of hydatid echinococcosis cases by type of treatment reveals that 98.44% of patients were operated and treated with PAIR (percutaneous puncture aspiration injection reinjection) and 1.56% of cases were medically treated ($p < 0,01$) (**Table I**).

Table I. Distribution of hydatidose cases by type of treatment.

		Type of treatment		
Years	**Number of cases of hydatid cysts detected and treated**	**Number of cases of hydatid cysts operated on**	**Number of cases of hydatid cysts treated medically**	**Number of cases of hydatid cysts treated by PAIR**
2009	49	49	00	49
2010	33	33	00	33
2011	40	40	00	40
2012	32	32	00	32
2013	66	66	00	66
2014	44	41	03	41
2015	38	36	02	36
2016	20	20	00	20
Total	**322**	**317**	**5**	**317**

DISCUSSION

The average annual incidence recorded in the prefecture of Meknes during the study period was 4.07 cases per 100,000 inhabitants, which is much lower than that reported by Derfoufi and his collaborators in the ex-region of Meknes-Tafilalet, where the rate was 11.9 cases per 100,000 inhabitants.[3] This rate is close to those reported in Morocco, Libya, and Algeria, which were 5.02, 4.2, and 4.6 per 100,000 inhabitants.[3] It is lower than that observed in Tunisia (15 per 100,000 inhabitants), which is the most endemic country in the Maghreb.[8]

The female sex was predominant in this study. In Morocco between 1980 and 1992, 75.4% of reported cases were female, compared to 24.6% male.[3] At Kenitra RHC, 72% of patients were female and the sex ratio (F/M) was 2.6 in favor of female.[9] Female predominance has also been reported by other authors.[2,10,11,12, 13, 14] This predominance could be explained by the fact that women have more promiscuous activities with dogs. In addition, daily handling of vegetables and agricultural work are mostly performed by women, which leads to an increased risk level of Echinococcus granulosus egg infestation. [15] On the other hand, a predominance of the male sex has been reported by Gharbi and his collaborators in Tunisia [16] and by Torgerson et al.[17] in Kyrgyzstan.

In Meknes, the most affected age group was 20-39 years old with 43.78% of cases. A similar result was reported by Derfoufi et al.[3] who noted that 41.7% of hydatidose cases were recorded in patients aged 20-39 years. This is due to late diagnosis and lack of selective signs of the disease.[9]

The liver and lungs are the organs most commonly infected by Echinococcus granulosus with 96.27% and 2.48% respectively. In Morocco, hydatidosis of the liver accounts for more than half of the cases operated on between 1980 and 1992, followed by that of the lungs with 37%.[15] This finding is also consistent with those reported by other studies. [3,9,10] This can be attributed to the fact that the liver acts as a primary filter in the human body and lung is often considered to be the second filter.[18]

At RHC of Meknes, 52.79% of the patients were from urban areas. In Argentina, 68.3% of patients lived in urban areas, 15.8% in rural areas and 8.3% on the outskirts of urban areas. [19]The predominance of the urban origin was found in other studies.[10,20,21,22] However, most authors have noted a dominance of rural origin.[3,9,23,24] The contamination of urban dwellers could be explained by migration from rural to urban areas and survival in poor hygienic conditions. Indeed, the ingestion of contaminated salads, the consumption of uncooked meat or the presences of domestic dogs in the home are favorable factors for the transmission of echinococcal tapeworm.[9]

In this series, 98.44% of patients were operated on and treated with PAIR and 1.56% was medically treated. PAIR is cheaper than conventional surgery, less invasive, minimally traumatic, and allows treatment of patients previously considered to be inoperable.[9] The proportion of patients treated with PAIR in Meknes greatly exceeds that observed by Derfoufi et al .which was 0.015%.[3]

This anthropozonosis has serious socio-economic consequences. These include morbidity due to undiagnosed cases, decreased quality of post-operative life for patients, reduced or lost revenue in case of complications and mortality due to cystic echinococcosis is estimated at 2%.[4] In addition, the cost of managing human hydatidosis cases is estimated at €1350 for each case treated surgically, or €427950 for 317 cases.[3,4]

CONCLUSION

Echinococcosis represents both a health and socio-economic problem for families and the health care facilities that receive them. The incidence, location, evolution and severity of this parasitosis should prompt us to conduct further research on this subject in order to find the most plausible solutions to reduce the negative repercussions.

REFERENCES

1. Ameur A, Lezrek M, Boumdin H, Touiti D, Abbar M, Beddouch A. Le kyste hydatique du rein. Traitement à propos de 34 cas, Progrès en Urologie, 2002; 12: 409-414.
2. El mansouri B, Laboudi M, Sadak A, Rhajaoui M. L'hydatidose humaine dans la région de Rabat (Maroc) : Etude de prévalence et apport du diagnostic sérologique. International Journal of Innovation and Scientific Research, 2015; 14(2): 252-258.
3. Derfoufi O, Akwa EN, Elmaataoui A, Miss E, Esselmani H, Lyagoubi M, Aoufi S. Profil épidémiologique de l'hydatidose au Maroc de 1980 à 2008. Ann Biol Clin, 2012; 70(4): 457-61.
4. DELM. Guide des activités de lutte, Disponible sur internet: URL:http://www.sante.gov.ma, 2007.
5. Azlaf R and Dakkak A. Epidemiological study of the cystic echinococcosis in Morocco. Vet Parasitol, 2006; 137(1-2): 83-93.
6. Budke CM, Deplazes P, Torgerson PR. Global socioeconomic impact of cystic echinococcosis. Emerg Infect Dis, 2006; 12(2): 296-303.
7. Wilson ME. A World Guide to Infections. Diseases, Distribution, Diagnosis. Oxford University Press, 1991; 769.
8. Aoun K and Bouratbine A. Epidemiological data concerning hydatidosis in Tunisia. Med Mal Infect, 2007; 37(Suppl. 1): 40-2.
9. Belamalem S, Khadmaoui A, Hami H, Harrak M, Aujjar N, Mokhtari A, Soulaymani A. Epidémiologie de l'hydatidose dans la Région du Gharb (Chrarda Béni Hssen) Maroc. Antropo, 2014; 31: 33-37.
10. Islami Parkoohi P, Jahani M, Hosseinzadeh F, Taghian S, Rostami F, Mousavi A, Rezai MS. Epidemiology and Clinical Features of Hydatid Cyst in Northern Iran from 2005 to 2015. Iran J Parasitol, 2018; 13(2): 310-316.
11. Alghoury A, El-Hamshary E, Azazy A, Hussein E, Rayan HZ. Hydatid Disease in Yemeni Patients attending Public and Private Hospitals in Sana'a City, Yemen. Oman Med *J*, 2010; 25(2): 88-90.
12. Bellil S, Limaiem F, Bellil K, Chelly I, Mekni A, Haouet S, Kchir N, Zitouna M. Épidémiologie des kystes hydatiques extrapulmonaires: 265 cas en Tunisie. Med Mal Infect, 2009; 39: 341-3.
13. Gonlugur U, Ozcelik S, Gonlugur TE, Arici S, Celiksoz A, Elagoz S, Cevit R. The retrospective annual surgical incidence of cystic echinococcosis in Sivas, Turkey. Zoonoses Public Health, 2009; 56(5): 209-14.
14. Culafic DM, Katic-Radivojevic S, Kerkez M, Vuckevic M, Rankovic V, Stefanovic D. Liver cystic echinococcosis in humans – a study of 30 cases. Helminthologia, 2007; 44: 157–161.
15. DELM. Etat d'avancement des programmes de lutte contre les maladies parasitaires, 2006..
16. Gharbi HA, Hassine W, Brauner Dupuchk ER MW. Ultra sound examination of the hydatic liver. Radiology, 1981; 139: 459- 463.
17. Torgerson PR, Karaeva RR, Corkeri N, Abdyjaparov TA, Kuttubaev OT, Shaikenov BS. Human cystic echinococcosis in Kyrgystan: an epidemiological study. Acta Trop, 2003; 85(1): 51-61.
18. Muller R, Director F, Wakelin D. Worms and human disease. 2nd ed. London UK, CABI Publishing, 2002.
19. Dopchiz MC, Elissondo MC, Rossin MA, Denegri G. Hydatidosis cases in one of Mar del Plata City hospitals, Buenos Aires, Argentina. Revista da Sociedade Brasileira de Medicina Tropical, 2007; 40(6): 635-639.
20. Ahmadi N and Badi F. Human hydatidosis in Tehran, Iran: a retrospective epidemiological study of surgical cases between 1999 and 2009 at two university medical centers.Trop Biomed, 2011; 28(2): 450-6.
21. Hamzavi Y, Vejdani M, Nazari N, Mikaeili A. The trend of hydatidosis in Kermanshah province, Western Iran (1986-2008). Iran J Parasitol, 2011; 6(4): 33-40.
22. Arbabi M and Hooshyar H. Survey of Echinococcosis and hydatidosis in Kashan region, central Iran. Iran J Public Health, 2006; 35(1): 75–81.
23. Laytimi F. Kyste hydatique du poumon (A propos de 115 cas). Thèse de Doctorat en Médecine, Université Sidi Mohammed Ben Abdellah, Faculté de la médecine et de pharmacie Fès, 2011; 162.
24. Tazi H and Badraoui M. Une cause inhabituelle de rétention aiguée d'urine: un kyste hydatique rétrovésical primitif. J. Maroc. Urol, 2007; 8: 24-2.
25. Eckert J and Deplazes P. Biological, epidemiological, and clinical aspect of Echinococcus, a zoonosis of increasing concern. Clinical Microbiological Review, 2004; 17: 1.