Journal of Pharmacy and Pharmacology 8 (2020) 281-285
doi: 10.17265/2328-2150/2020.09.003

Hydatid Cyst in Children at Nelson Mandela Academic Hospital: A Five Years Study

Arturo L Delgado, Mfuneko Kopolo, Dumo Bangaza, Luke Yamkela and Thabane

Department of Surgery, Nelson Mandela Academic Hospital (NMAH), Walter Sisulu University (WSU), Umtata 5117, Eastern Cape, South Africa

Nelson Mandela Academic Hospital, Walter Sisulu University, Umtata, Eastern Cape, South Africa

Abstract: Introduction: Hydatid disease is one of the important health problems in developing countries. It is a parasitic disease that can affect any part in the human body, but it commonly affects lungs and liver. Because of poor data and preventive measures in sub-Saharan Africa, cystic echinococcosis (CE) is regarded as endemic disease. Aim: To assess the behaviour of the Hydatid Cysts and the organs commonly affected in children in our rural population. Method: This is retrospective longitudinal analysis of children between the ages of 3 to 12 years that were admitted in paediatric surgical unit at Nelson Mandela Academic Hospital (NMAH) in Eastern Cape, South Africa. The study was conducted on patients admitted between April 2015 and April 2020. The aim of the study was to assess which age group, sex and organs commonly affected by the hydatidosis in our children. Results: We studied 50 children; the group of age most affected was 3 to 12 years. The females accounted for 58%, and 42% males. In our patients, 38% had hydatid lung cysts, 46% liver cysts only, 6% had both liver and lung hydatid cysts, 4% had liver, lung and spleen, another 4% mesenteric cyst and 2% hamstring muscle hydatid cyst. In 40 (80%) cases, the treatment was surgical: puncture-aspiration-injection and reaspiration (PAIR) removing the endo-cyst layer, followed by medical treatment with Albendazole and Praziquantel, only 10 (20%) cases required medical treatment alone. On the operated cases the endo cyst was taken for histopathology. Conclusion: Females were most affected than males and the liver was the organ most affected with 38%, followed by lung.

Key words: Hydatidosis, PAIR, CE, *Echinococcus granulosus*.

1. Introduction

Echinococcosis is a zoonotic disease caused by a parasitic infection with the larval stage of the tapeworm Echinococcus genus [1]. Cystic echinococcosis is the most common form of the disease, is caused by *Echinococcus granulosus* [2]. Echinococcus circulates in domestic animals and may affect humans. Adult tapeworms are carried by the definitive host, dogs asymptomatically and transmit the worms through defecation and end up contaminating humans through ingesting affected intermediate host. Human hydatid cyst is still a serious health problem in developing countries [3]. The hydatid cyst remains asymptomatic for years until the time of complication, where there are compressive symptoms or rupture of the cyst causing anaphylactic shock. Symptoms are non-specific [4].

Echinococcal cyst can affect any organ, including the muscles but the commonest affected organs are lungs, liver and spleen (Figure 1). When the liver is affected it may cause a rise in intra-abdominal pressure and may cause obstructive jaundice when there is compression to the biliary system (Figure 2). These patients with cyst localization in the lung usually present with productive cough, copious sputum production, weight loss and poor appetite.

Rupture of the cyst to pleural cavity can also present with shortness of breath and on chest X-ray it can be confused with pneumonia pleural effusion, in which in our study some patients were inserted chest drain and found later after repeat chest x-ray and CT-chest that patient has cystic cavity [5-7].

Our main aim was to assess the behaviour of the Hydatid Cysts and the organs commonly affected in our children in our rural population.

2. Methods

Was performed a retrospective longitudinal study of every child admitted in our surgical paediatric ward, suffering from hydatid cyst. The study accounted patients from April 2015 to April 2020. We studied 50 patients; for the statistical study were analysed different variables such as age, sex, localization of the cyst, treatment performed and outcome, for its statistical study were created tables of all patients with hydatid cyst of the lung, liver and other organs, who were treated medically and surgically. The study was conducted in children from 3 to 12 years. The diagnosis was based on clinical history, clinical examination, serology test, abdominal ultrasound, computer tomography and histology.

A surgical treatment was performed based on the size of the cyst which was 6 cm and above, and when the patient having compressive symptoms and signs of complicated hydatid cyst. For hydatid in liver the compressive symptoms and sings were jaundice, itchiness, elevated liver enzymes. Hydatid cyst in the lung, the patient could present productive cough, shortness of breath, bronchial communication and ruptured cyst to the pleural cavity. Patients with hydatid liver cyst were done puncture-aspiration-injection and reaspiration (PAIR) through laparotomy and then those with lung were done PAIR through thoracotomy. We use 5% hypertonic saline solution for the injection after PAIR; the cyst was opened and removed the endocyst and taken for histopathology; a capitonage was done in every cyst and a drain left in the cyst cavity. In the post-operative time, the children will continue with oral albendazole (20-50 mg/kg/day) and praziquantel (30-40 mg/kg/day) for a minimum of 3 months.

Those with hydatid cyst measuring less than 5 cm or less and with no compressive signs and complications were treated medically. A combination of albendazole and praziquantel was given for two months or more depending on the resolution of the cyst, and then continue with only albendazole for the next 4 months. Base line blood tests (Full Blood Count, liver function enzymes) were taken before the

Corresponding author: Arturo L Delgado, Dr., associated professor, consultant paediatric surgeon, research field: surgery.

Fig. 1 Patient with multiple hydatid cyst in the liver.

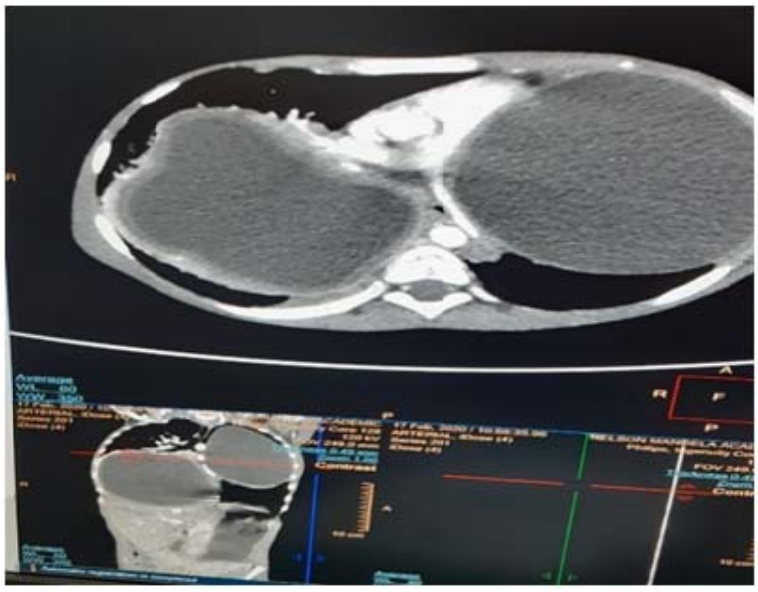

Fig. 2 Bilateral lung hydatid cyst.

initiation of the treatment, to monitor drug toxicity and every month.

3. Results

A total of 50 cases were analysed, 23 of whom (46%) had liver hydatid cyst, with 19 (38%) hydatid lung cysts. Some patients (6%) had hydatid affecting liver, and lungs as shown in Table 1.

The most affected age group was the group between 5 to 10 years accounting for 66%, followed for the group of children with more than 10 years in 22% (Table 2).

The hydatid cysts in liver were more frequent in females than male with a relation of 2:1, while lung hydatid affected 22% of male with 16% females as shown in Table 3.

Table 1 Number of cases vs. organ affected.

Diagnosis	No. of cases	%
Lungs	19	38
Liver	23	46
Liver and lungs	3	6
Liver, lung and spleen	2	4
Mesenteric cyst	1	4
Lower limb muscle	2	2
Total number of cases	50	100

Table 2 Age group vs. organ affected.

Organ affected	1-5 years	5-10 years	> 10 years	Total	%
Liver hydatid cyst	4	12	7	23	46
Lungs	2	13	4	19	38
Lung and liver	-	3	-	3	6
Liver, spleen and lung	-	2	-	2	4
Mesenteric	-	2	0	2	4
Lower limb muscle	-	1	-	1	2
Total	6 (12%)	33 (66%)	11 (22%)	50	100

Table 3 Sex vs. organ affected.

Organ affected	Male (%)	Female (%)	Total (%)
Lungs	22	16	38
Liver	16	30	46
Liver and lungs	2	4	6
Liver, lung and spleen	2	2	4
Mesenteric cyst	-	4	4
Lower limb muscle	2	-	2
Total number of cases	44	56	100

Table 4 Operated cases vs. histology results and serology.

Operated cases	No. of cases	Echinococcus Elisa	Histopathology confirmed (+) *Echinococcus granulosus*
Liver	17	+	+
Lungs only	14	+	+
Liver, lung and spleen	2	+	+
Liver and lungs	4	+	+
Muscles, mesentery	3	+	+
Total	40 (80%)		

In 40 cases (80%) was performed surgical treatment, done PAIR and enucleation of the endocyst. A total of 10 (20%) cases were managed successfully with medical treatment over a period of 6 to 8 months (Table 4).

The endocyst was taken for histopathology which confirmed infection by *Echinococcus granulosus.*

4. Discussion

Hydatid disease is still a national problem in highly endemic countries and needs epidemiologic prevention for its eradication [3]. The symptoms of hydatid disease depend on which organs are affected. Most patients with hydatid cysts are asymptomatic, and the diagnosis is usually made incidentally during clinical or radiological examination for unrelated reasons [8].

Of our 50 cases, 22 (44%) were males and 28 (56%) females. Statistical analyses indicate that in children males are more likely to be infected with lung hydatid,

while females were infected more with liver hydatid. In our study hydatid cyst in children affect more the liver (46%) than lungs (38%) [5-14].

Hydatid cyst can occur anywhere in the body but the two most commonly involved organs are liver and the lungs. Concurrent involvement of lungs and the liver in our study accounts 6%, a report published by Aghajanzadeh et al., reported 4% to 25% of cases located on these organs.

Primary mesenteric hydatid cyst is rare mostly published as case reports [8]. The common affected age group was between 5 and 10 years, 32 (64%) of cases. *Echinococcus granulosus* is the most common cause of human hydatid cyst, as confirmed with histopathology of the endocyst.

5. Conclusions

In children the incidence of hydatid disease increased with age. The most involved organs were liver then lungs. Since there were cases of hydatid cyst of both lung and liver, we recommend that when a hydatid cyst of the liver is diagnosed a chest X-ray should be done to rule out lung involvement in endemic regions. *Echinococcus granulosus* is the most common cause of human hydatid cyst in our region as diagnosed with echinococcus Elisa and confirmed with endocyst taken for histopathology.

A conservative surgical technique (PAIR and partial enucleation of the endocyst) is sufficient in most cases, followed by medical treatment post operatively.

References

[1] Larrieu, E. 2017. *Prevention and Control of Hydatidosis at Local Level South American Initiative for the Control and Surveillance of Cystic Echinococcosis*.

[2] Albadawi, A. A. M., et al. 2018. “Role of Serology and Histopathology in Diagnostic of Human Cystic Echinococcosis.” *J Aids Hiv Inf* 4 (2): 203.

[3] Mirshemirani, A., Khaleghnejad, A., Kouranloo, J., Sadeghian, N., Rouzrokh, M., and Hasas-Yeganeh, S. 2011. “Liver Hydatid Cyst in Children (A 14-year Review).” *Iran J Pediatr* 21 (3): 385-9.

[4] Botezatu Cristian et al. 2018. “Hepatic hydatid cyst – diagnose and treatment algorithm.” *Journal of Medicine and Life* 11 (3): 203-209.

[5] Singh, B. K. 2018. “Mesenteric Hydatid Cyst.” *Nepalese Journal of Radiology* 8 (12): 43-6.

[6] Ramos, G., Orduña, A., and Garcaí-Yuste, M. 2001. “Hydatid Cyst of the Lung: Diagnosis and Treatment.” *World J Surg* 25 (1): 46-57.

[7] Santivanez, S., and Garcia, H. H. 2010. “Pulmonary Cystic Echinococcosis.” *Current Opinion in Pulmonary Medicine* 16 (3): 257-61.

[8] Zhang, W., Wang, S., and McManus, D. P. 2014. “*Echinococcus granulosus* Genomics: A New Dawn for Improved Diagnosis, Treatment, and Control of Echinococcosis.” *Parasite* 21: 66.

[9] Montazeri, V., Sokouti, M., and Rashidi, H. R. 2007. “Comparison of Pulmonary Hydatid Disease between Children and Adult.” *Tanaffo*s 6 (1): 13-8.

[10] Velasco-Tirado, V., et al. 2017. “Recurrence of Cystic Echinococcosis in an Endemic Area: A Retrospective Study.” *MBC Infectious Diseases* 17: 455.

[11] Botezau, C., Mastalier, B., and Patrascu, T. 2018. “Hepatic Hydatid Cyst-Diagnose and Treatment Algorithm.” *Med life* 11 (3): 203-9.

[12] Sumer, A., Caglayan, K., Altinli, E., and Koksal, N. 2009. “Case Report: Spontaneous Liver Hydatid Cyst Rupture in a Child.” *Israel J Emerg Med* 9 (1): 13-6.

[13] Talaiezadeh, A., and Maraghi, Sh. 2006. “Hydatid Disease in Children: A Different Pattern than Adults.” *Pakistan J Med Sci* 22 (3): 329-32.

[14] Bulent, K., Gultekin, G., Serdar, H., et al. 2008. “Analysis of Pulmonary Hydatosis According to Their Segmentary Locations.” *Clin Pulm Med* 15 (1): 8-12.