



# XXVII WORLD CONGRESS OF ECHINOCOCCOSIS

4<sup>th</sup> – 7<sup>th</sup> OCTOBER, 2017

ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par1		Video		Poster	
Title	What's new in the surgical management of the Cystic Echinococcosis in the lung?									
Authors	ACHOUR KARIMA									
Affiliation	Department of thoracic surgery University Hospital of Iamine Debaghine ex Maillot, Algiers , Algeria <a href="mailto:achour.karima@gmail.com">achour.karima@gmail.com</a>									
ABSTRACT O_Par1_1										
<p>Hydatidosis is a parasitic disease common in Mediterranean countries; the most often affected organs are the liver and the lungs. It's usually asymptomatic and discovered incidentally. For many years, surgery has been the only treatment available for hydatid cyst. The main goal in the surgical approach of Hydatid Cystic is the remove of the entire cyst.</p> <p>Currently, the treatment of hydatid cysts involves surgery (conventional surgery or video surgery), and medical therapy with benzimidazoles (BMZ). In the lung, the percutaneous drainage (PAIR) of cysts has not proved effective, given the high complication rate.</p> <p>The hydatid cyst surgery is always based on principles of bases that are: complete removal of the cyst (if feasible), protection of the operative field, prevention of bronchus damage and the management of the residual cavity.</p> <p>We'll discuss the main surgical techniques practiced on the lung and compare video surgery with conventional surgery.</p>										

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ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par1		Video		Poster	
Title	Peculiarities of Lung CE – Experience in Sudan									
Authors	MOHAMED E AHMED <sup>1,2</sup> , IMADELDIN ARADAIB <sup>1</sup> , MARTIN GROBUSCH <sup>3</sup> .									
Affiliation	1- Department of Surgery Faculty of Medicine , 2- Neelain Medical Institute of Research (NMIR) , Al Neelain University , Khartoum , Sudan; 3- Department of Infectious Diseases, Faculty of Medicine, Amsterdam Medical College, Amsterdam , The Netherlands <a href="mailto:m_e_ahmed@hotmail.com">m_e_ahmed@hotmail.com</a>									
ABSTRACT O_Par1_2										
<p>Cystic Echinococcosis (CE) is a neglected zoonotic cosmopolitan parasitic infection, in domestic life were dogs are definitive hosts, 70-90 percent of stray dogs in Sudan were infected. In livestock 35 percent of camels, 10 percent of cattle and sheep are the intermediate host of <i>Echinococcus</i> s.l. In wildlife 7-9 percent of foxes and a case of lion Echinococcosis have been identified. In hospital based study in Khartoum Pulmonary EC is almost half of the cases presented, followed by liver. Genotyping of human <i>Echinococcus</i> spp. in cyst samples following surgery of the lungs, liver and other sites showed that <i>Echinococcus granulosus</i> was of genotype 6 (G6). In a large series of camels exported from Sudan to Egypt about half a million slaughtered camels for meat production, the main organ affected was the lung .This is the same finding at the camel slaughter house in Tamboul central of Sudan were lung to liver involvement is 12:1. <i>Echinococcus granulosus</i> G6 has been found in all human lung cases. The definitive preoperative diagnosis is difficult; ultrasound is not useful, advanced imaging is always needed. Percutaneous biopsy is not a routine procedure, mini surgery of the chest is the most appropriate procedure, associated benign pathology was found in many cases. Apart from parenchymal lung CE, subcutaneous thoracic location including chest wall and visceral pleura as well as malignancy in some case can be found. Multiple lesions, uni or bilateral, in the lung, are not uncommon. Following surgery definitive diagnosis is simple. PCR is useful for unusual sites associated with epidemiology. Outcome of surgery is excellent which is followed by three month course of chemotherapy (Albendazole ). Post-surgery follow up of cases for many years showed no recurrences and complications.</p>										

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ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par1		Video		Poster	
Title	Surgical management of bilateral pulmonary hydatid cysts									
Authors	SIHAM DAHEL, ABDELKRIM SAAOUI, TAYEB DERAZ, OMAR ZEBAIR, KAIS SAADA, ALI AMEZIANE BELHAMRI, KARIMA ACHOUR									
Affiliation	Department of thoracic surgery; University Hospital Lamine Debaghine ex-Maillot, Algiers , Algeria <a href="mailto:achour.karima@gmail.com">achour.karima@gmail.com</a>									
ABSTRACT O_Par1_3										
<p><b>Aim:</b> Cystic echinococcosis is a parasitic infection that is endemic in many parts of sheep and cattle farming areas and it is still a real public health problem in the world. The lung is the second most frequent localization. It is usually asymptomatic and discovered incidentally. However there are a number of patients who present with bilateral forms and will require a complex management with significant morbidity and mortality rates .The purpose of this work was to report the specific management of these complicated forms. It should be considered that there are many situations with no consensus, such as: conventional regular surgery or not, approaching the bilateral cysts in one session or two, place of pleurectomy for intrapleural ruptured cysts, and timeline in the management for the associated KHP and liver location . The important criteria are a more simple immediate postoperative course and less long term recurrence.</p> <p><b>Methods:</b>We reviewed the records of 2041 patients operated on for pulmonary hydatid cyst in our department during a 30-year period (1983-2012).</p> <p><b>Results:</b> The PHC essentially affected young men; 187 patients (9.16%) had PHC scattered throughout both lungs, including 63 patients (3.07%) who had pulmonary extra localization (mainly liver). 81.28% of patients (n = 152) benefited from two-stage surgery. In our series the morbidity was 19% and the mortality was 2.67%.</p> <p><b>Conclusion</b> The prognosis of PHC depends fundamentally on the stage of evolution, the cysts location, the number of cysts, and the quality of the initial treatment.</p>										

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ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par1		Video		Poster	
Title	The Malignant Form of Hydatid Cyst of the Heart									
Authors	RYM BOUREZAK, MOURAD AOUICHE, HAKIM HIMEUR, ASSIA HADDAD, SALAH EDDINE BOUREZAK									
Affiliation	Cardiac surgery ; clinique Djillali Rahmouni ; Algiers, Algeria <a href="mailto:rymbourezak@gmail.com">rymbourezak@gmail.com</a>									
ABSTRACT O_Par1_4										
<p><b>Background and Aim:</b> The malignant form of hydatid cyst of the heart is very serious illness, we report a series of patients at different developmental stages and different locations, the severity of the impact and patients outcomes, and surgical techniques adapted to each case.</p> <p><b>Methods:</b> From January 1994 to December 2016, 49 patients was operated on for malignant cardiac hydatidosis, aged between 16 and 72 years, wich 32 women. 60% had multi-visceral secondary sites, 35% were ruptured in cardiac cavities, 15% had multiple intracardiac sites and 15% were pericardiac. Characterized by clinical polymorphism secondary to severe complications: rhythm disorders, heart failure, tamponade or peripheral ischemia. All cases were diagnosed by echocardiography. 29 patients benefited from CT/MRI in search of other sites. All patients underwent emergency surgery, in CPB for intra-cavitary cysts (42p) and beating heart for superficial or pericardial parietal cysts (07p). Patients with visceral location were referred to the surgical departments according to the affected organ.</p> <p><b>Results:</b> Mortality was 4% (n = 2), one immediate due to left ventricular dysfunction, and one late due to multivisceral hydatid disease with cerebral involvement. Four patients were reoperated for recurrence, one for polycystic heart disease, two for pulmonary embolism and one for embolism in the lower limbs.</p> <p><b>Conclusion:</b> Hydatic cardiac cyst is a serious illness and should be systematically search for in extracardiac hydatidosis. Echocardiography is sufficient to assess the diagnosis. Morbidity is related to intracardiac localization, visceral secondary sites and peripheral embolisms of ruptured cyst. Surgery remains the only therapeutic option with good results in the short and long term to avoid the evolution towards severe complications.</p>										

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ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par1		Video		Poster	
Title	Recurrence of hydatid cyst in child: Diagnosis and management									
Authors	MAKHOLOUF DORSAF, BELHASSEN SAMIA, MESSOUD MARWA, BEN FREDJ MARIEM, MOSBAHI SANA, HIDOURI SAIDA, KSIAA AMINE, SAHNOUN LASSAAD, MEKKI MONGI, BELGHITH MOHSEN, NOURI ABDELLATIF									
Affiliation	Department of pediatric surgery, EPS Fattouma Bourguiba of Monastir, Tunisia <a href="mailto:sana_mosbahi@yahoo.fr">sana_mosbahi@yahoo.fr</a>									
ABSTRACT O_Par1_5										
<p><b>Background and Aims:</b> Recurrence of hydatid cyst in child is relatively new areas of investigation due to the limited number of cases. It is defined as the appearance of new active cysts after therapy, including reappearance with continuous growth of live cysts at the site of a previously treated cyst or the appearance of new distant disease resulting from spillage.</p> <p>The aim of this study is to assess the management of hydatid cyst recurrence after surgical treatment and to identify the predictive factors of recurrence.</p> <p><b>Methods:</b> Between March 2000 and March 2017, 8 children (6 boys and 2 girls) have been diagnosed with recurrent hydatid cyst disease. They were admitted to the pediatric surgical department. We retrospectively analyzed the patients' sex, age, symptoms, biological data, characteristics of hydatid cysts (location, number and size) and the treatments.</p> <p><b>Results:</b> The patients were of ages ranging from 7 to 18 years old. Two of them had double localization: one in the liver and lung, the other in the liver and spleen. The delay of recurrence ranged from 1 to 6 years.</p> <p>Concerning the recurrent lung hydatid cyst, the respiratory symptoms were made by cough and chest pain in the 4 cases. However, children with recurrent liver hydatid cyst were asymptomatic . For all patients, the diagnosis of hydatid recurrence was made based on chest x-ray, abdominal ultrasonography (US) and computed tomography (CT) findings, with positive hydatid serology. All patients were reoperated. Thoracotomy was performed for all patients with lung hydatid cyst. Two surgical approaches have been used for the treatment of liver cyst: laparoscopic approach in 3 cases and open approach in one case. All patients were treated with Albendazole. The mean follow-up was approximately 6 years.</p> <p><b>Conclusion:</b> The management of patients with recurrent hydatid disease is difficult. Occasionally, it is necessary to treat recurrent disease repeatedly. The risk of recurrence was highest in children with multiple cysts. This showed the importance of long term follow up.</p>										

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ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par1		Video		Poster	
Title	Renal hydatid cysts in children: about 11 cases									
Authors	MOSBAHI SANA, HIDOURI SAIDA, EZZI AZIZA, BEN FREDJ MARIEM, BELHASSEN SAMIA, KSIA AMINE, SAHNOUN LASSAAD, MEKKI MONGI, BELGHITH MOHSEN, NOURI ABDELLATIF									
Affiliation	Pediatric Surgery Unit, UH Fattouma Bourguiba Monastir, Tunisia <a href="mailto:sana_mosbahi@yahoo.fr">sana_mosbahi@yahoo.fr</a>									
ABSTRACT O_Par1_6										
<p><b>Background and Aims:</b> The purpose of this study is the description of the clinical and paraclinical characteristics of the renal hydatid cyst in children and its therapeutic treatment.</p> <p><b>Patients and methods:</b> This retrospective study is about 11 children operated for renal hydatid cysts in the Pediatric Surgery Unit of Monastir from 1995 to 2016.</p> <p><b>Results:</b> The patients were between 3 and 14 years old with 8 years and a half as an average age. The patients were 5 boys and 6 girls. Revealing clinical symptomatology was dominated by lumbar pain in 7 cases. Hydatiduria was noted in 2 cases. The positive diagnosis was based on imaging and hydatid serology.</p> <p>Open-air surgery was opted for in 7 cases and video-assisted surgery in 4 cases 3 of which were laparoscopies and one retroperitoneoscopy. No recurrence was noticed after 5 years follow-up.</p> <p><b>Conclusion:</b> The treatment of renal hydatid cysts in children is essentially surgical. Surgery could be open-air or video-assisted which has the advantage of being minimally invasive. The prognosis is often favorable.</p>										

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ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par1		Video		Poster	
Title	Historical case of a malignant pulmonary and cardiac hydatidosis operated on without recurrence after 10 years of follow-up.									
Authors	KARIM MESKOURI, YACINE MEDJDOUB									
Affiliation	Thoracic and cardio-vascular surgery. CHU Mustapha, Algiers, Algeria <a href="mailto:meskourik@yahoo.fr">meskourik@yahoo.fr</a>									
ABSTRACT O_Par1_7										
<p><b>Background and Aims:</b> To report the case of a patient currently aged 30 years, surgically treated for bilateral malignant pulmonary and cardiac hydatidosis.</p> <p><b>Methods:</b> The patient was operated several times, the first intervention on the right lung and then on the left lung in 2005, followed by several complications on the right lung resulting in pneumonectomy and collapse thoracoplasty in 2008.</p> <p>Surgery was also performed in 2005 in cardiac surgery for inter-ventricular hydatid cysts.</p> <p><b>Results:</b> There was no recurrence, either in left lung or in the heart for 10 years.</p> <p><b>Conclusion:</b> In the absence of medical treatment, non-available at that time in Algeria, surgery gave a chance of cure to this patient with recurrences of a pulmonary hydatidosis.</p>										

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ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par1		Video		Poster	
Title	Recurrent hydatid cysts.									
Authors	LYES RAHAL, CHARAFEDDINE BOUNAB, TAHAR HACHEMI, DJAAFER FEKHAR, FETHIA MOUSSAOUI, AHMED AZOUAOU.									
Affiliation	Service de chirurgie, CHU DOUERA, Algeria <a href="mailto:lvath2003@yahoo.fr">lvath2003@yahoo.fr</a>									
ABSTRACT O_Par1_8										
<p><b>Background and Aims:</b> Despite the progress in the management of the hydatid cyst, there is still a public health problem in the endemic areas and providers of post-operative morbidity and recurrence. Surgery is the mainstay of KHF treatment, the main objectives of which are complete sterilization of the parasite, the least possible morbidity and mortality and, above all, prevention of recurrences. It proposes two radical and conservative approaches. The latter depend on the localization of the cysts and their numbers in the liver.</p> <p>The objectives of the study were to evaluate the radical and conservative surgical techniques and to see which of the two approaches provide more recurrences.</p> <p><b>Materials and methods :</b></p> <p>We collected 59 cases of operated patients for liver hydatid cyst between 2011 and 2017. In 34 cases the cyst was in the right liver, 13 cysts were on the left liver and in 12 cases the cysts were and on the right liver and liver left. Of these 59 patients, 8 showed a relapse of the hydatid cyst. Systematic abdominal ultrasound for all patients was the key examination, with CT being reserved for patients with diagnostic doubt or vascular requirements. Hydatid serology was positive in 27 cases.</p> <p><b>Results:</b> Surgical treatment was dominated by conservative methods. Resection of the protruding dome was performed in 26 cases. Partial pericystectomy was performed in 29 cases. The rest were liver resections.</p> <p>Morbidity was dominated by suppurations in 14 cases and external biliary fistulas in 7 cases. Recurrences were observed in 8 cases, of which 3 received pericystectomy during the first procedure, 1 patient with left hepatectomy and 4 patients with resection of the protruding dome.</p> <p><b>Conclusion:</b> Recurrences may appear after all therapeutic methods, although many authors believe that it is conservative methods that are incriminated in recurrences. Surgery of recurrence is still very complicated.</p>										

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ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par1		Video		Poster	
Title	Imaging of the complicated pulmonary hydatid cyst									
Authors	LAMRI ZEGGAR <i>MEHDI</i> , MAKHBOUCHE <i>TAREK</i> , BALBEKRI <i>MEHDI</i> , TALAB <i>CHAIBE</i>									
Affiliation	Thoracic Surgery, CHU Constantine, Algeria									
ABSTRACT O_Par1_9										
<p><b>Background and Aim:</b> Presentation of the various radiological aspects of complicated pulmonary hydatid cyst through a series of 57 patients insisting on the place of chest CT.</p> <p><b>Methods:</b> Retrospective study of 57 patients with complicated pulmonary hydatid cyst collected between May 2007 and May 2017, aged 17 to 68 (average age 42.5), men 64 (66%), women 33 (34%), all patients benefited from chest X-ray; CT scan was performed in 51 patients; all patients were operated on; the confirmation of the diagnosis was obtained by the pathological study. In this series the patients with an extra-thoracic localization were discarded.</p> <p><b>Result:</b> The total number of cysts counted on the standard radiography was 68. The right location was the most frequent, with 43 lesions (63%). The most frequently encountered form of the complicated hydatid cyst was the image of the floating membrane, 29 lesions. CT showed the image of pneumocyst secondarily the most frequent 19 lesions;</p> <p>The false diagnosis reported by CT was 14 lesions:</p> <p>1 case of pseudo-tumor image,</p> <p>4 cases of pulmonary suppurations,</p> <p>2 cases of image in bell-shape,</p> <p>7 cases of excavated lesions.</p> <p><b>Conclusion:</b> Thoracic CT allows the diagnosis of complicated pulmonary hydatid cyst in the majority of cases and is essential for the orientation of the diagnosis.</p> <p>Nevertheless it is imperfect for the pseudo-tumor form and in the absence of any evocative serological or clinical evidence, infected or totally evacuated hydatid cyst and in the absence of extra-thoracic localization.</p>										

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ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par1		Video		Poster	
Title	Medico-surgical approach for disseminated hydatidosis in children: about 14 cases									
Authors	HADDAOUI <i>MARIEM</i> , HIDOURI <i>SAIDA</i> , MOSBAHI <i>SANA</i> , KSIAA <i>AMINE</i> , MAKHLOUF <i>DORSAF</i> , BELHSAN <i>SAMIA</i> , SAHNOUN <i>LASSAD</i> , MEKKI <i>MONGI</i> , BELGHITH <i>MOHSEN</i> , NOURI <i>ABDELATIF</i> .									
Affiliation	Department of Pediatric Surgery, Fattouma Bourguiba College Hospital. Monastir. Tunisia <a href="mailto:mariouma.hadd@gmail.com">mariouma.hadd@gmail.com</a>									
ABSTRACT O_Par1_10										
<p><b>Background and Aims:</b> Before the use of Albendazole, disseminated hydatidosis was a pathology often fatal in children. The litterature seems to be poor about the efficiency of Albendazole in disseminated hydatidosis. The aim of this work is to evaluate the efficiency of the Albendazole treatment in the disseminated hydatidosis of child and to suggest additional surgical treatment in case of absence of cure.</p> <p><b>Material and methods:</b> We report a prospective study of 14 cases of children aged from 4 to 15 years with pulmonary, cardiac, hepatic, splenic, renal or peritoneal disseminated hydatidosis. Our patients had approximatively 357 hydatid cysts. All children were treated with Albendazole at a dose of 10mg / kg /per day continuously. Follow-up was: clinical, biological and radiological.The total duration of Albendazole treatment varied from 6 months to 6 years.</p> <p><b>Results:</b> All patients showed clinical improvement without adverse effects attributed to Albendazole. After 1 to 6 years of treatment with Albendazole,a complete cyst regression was found in 65% of pulmonary cysts, 30% of liver cysts and 96% of peritoneal cysts. Totally calcifications were observed in only one patient.</p> <p>Five patients with hepatic hydatidosis required a surgical treatment after improvement by Albendazole with persistence of large cysts. The procedure was laparoscopic in 3 cases and laparotomy in 2 cases. This surgery allowed a definitive cure in a total of 72 cysts. No productive bilio-cystic fistula was seen in per or post-operative.</p> <p>Surgical treatment increased the rate of cure of liver cysts to 70%. On parasitological examination, 30% of operated hepatic cysts were viable even 3 years after treatment with Albendazole.</p> <p><b>Conclusion:</b> Our results confirm the efficiency of Albendazole administrated in monotherapy in pulmonary and peritoneal sites. For liver localizations, surgical complement is often required. Surgery is facilitated by prior treatment with Albendazole and some patients can be operated on with laparoscopic pathway.</p> <p>With our results, we propose 18 months of treatment for pulmonary hydatidosis and 3 years for hepatic hydatidosis. Despite this prolonged treatment, resistance is found in 30% and should incite to seek new scolicides molecules. Insufficient treatment may lead to recurrence.</p>										

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ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par2		Video		Poster	
Title	Visceral Hydatid Cyst: 2 clinical cases									
Authors	Ahmed. AZOUAOU, Kamel SI-AHMED									
Affiliation	University Department of Surgery, CHU Douera& CHU Blida, Algeria <a href="mailto:azouaou.ahmed@yahoo.fr">azouaou.ahmed@yahoo.fr</a>									
ABSTRACT O_Par2_1										
<p><b>Background and Aims:</b> The hydatid cyst in humans (HK) due to the development of the parasite's larva of the dog, would concern up to 5% of the subjects living in a strong endemic zone with a lethality rate between 2 to 4%.</p> <p>It can be presented in various clinical pictures which may differ as much by their localization, their evolution and their therapeutic consequences.</p> <p><b>Methods:</b> The authors report two illustrations of rare location and therapeutic modality.</p> <p><b>Results:</b>The first case was one of the rare localizations of the hydatid disease: the pancreas. We can consider that the difficulty here is not therapeutic, but lies in the diagnosis which was often an operative discovery, currently greatly facilitated by the methods of morphological imaging: CT in a patient of 19 years addressed in 2<sup>nd</sup> hand for painful epigastric mass.</p> <p>The second observation concerns a radical therapeutic modality (hepatectomy) for hydatid cyst of the liver recurrence in a patient already operated on 5 occasions! (Thorax, Liver). Indeed, these hepatectomies for KHF involve, for many surgeons, a disproportionate severity with the benignity of the causal disease.</p> <p><b>Conclusion:</b> If the effectiveness of surgical treatment is no longer to be demonstrated, it should be recalled that the recurrence rate is far from negligible by 2 to 10%, particularly in the case of conservative procedures (resection of the protruding dome). However the disease should be treated definitely and with safety. A major hepatectomy therefore deserves a restricted but indisputable place and is only possible for the excision of larval forms when the parasite occupies only a part of the liver.</p>										

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ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par2		Video		Poster	
Title	Management of complicated cysts; study of 8 cases									
Authors	FETHI MERAD-BOUDIA, NADJAT AZZI, DJAMEL BENAIBOUCHE, HAMID KACI, FOUAD BOURAS									
Affiliation	General surgery. CHU Bab El Oued, Algiers, Algeria meradfethi@yahoo.fr									
ABSTRACT O_Par2_2										
<p><b>Background and Aim:</b> Over the past ten years, the concept of complicated hydatid cyst of the liver (HCL) has been a recurring theme in the congress program. On the other hand, there is a lot of communication concerning the simple cysts. This aspect deserves a clarification which passes imperatively by the definition to retain the "complicated" HCL. The aim of our paper is to analyze the various complications that we have encountered in our experience in order to retain a definition.</p> <p><b>Methods:</b> Among our HCL cases, we found several complications of variable frequency: open HCL in the biliary tract (3 cases), HCL and Budd-Chiari syndrome (2 cases), HCL and cirrhosis (2 cases), HCL complicated by its topography and its size (1 case).</p> <p><b>Discussion:</b> The evolution of a HCL is the progressive destruction of the hepatic parenchyma with vascular corbelling. The healthy hepatic parenchyma naturally evolves towards compensatory hypertrophy, which makes it possible to avoid all the disappointments of the hepatocellular insufficiency. On the other hand, cyst evolution occurs naturally towards bilio-cystic fistula. Forms without cholestasis were simple to manage, while forms with cholestasis had to meet the requirements of biliary surgery.</p> <p>The evolution towards Budd-Chiari syndrome or cirrhosis was the result of an error in the initial management.</p> <p>The HCL of the dome required discussing the surgical pathway first in order to meet the principles of drainage in surgery.</p> <p>The giant cyst required an accurate analysis of the hepatic parenchyma left in place before considering a surgical strategy.</p> <p><b>Conclusion:</b> In our experience, resection of the protruding dome allowed the correct treatment of all forms of HCL. All other surgical possibilities can be proposed following the principles of hepatobiliary surgery. In 2017, the concept of complicated HCL deserves to be completely revisited and its surgical management must be integrated as part of liver surgery. Should "complicated" HCL not be replaced by "become complicated" HCL by a random initial assumption?</p>										

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# XXVII WORLD CONGRESS OF ECHINOCOCCOSIS

4<sup>th</sup> – 7<sup>th</sup> OCTOBER, 2017

ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par5		Video		Poster	
Title	Total pericystectomy of hydatid cysts of the liver.									
Authors	<u>SALAH BERKANE</u> (1), ALI BENNANI(2), SALIM BELKHERCHI(1), LARBI ABID(2).									
Affiliation	1- Department of visceral surgery. CHU of Bejaia. Faculty of medicine of Bejaia, Algeria 2- Departement of visceral surgery. EPH of Bologhine. Faculty of medicine of Algiers, Algeria <a href="mailto:salahberkane07@yahoo.fr">salahberkane07@yahoo.fr</a>									
ABSTRACT O_Par2_3										
<p><b>Background and Aims:</b> Techniques are used to treat the patient with the maximum safety and at the lowest cost. Total pericystectomy is a therapeutic method recognized as radical and that which without sacrificing the liver leads to the simplest operative follow-up; its performance, on the other hand, remains difficult and classically haemorrhagic. The aim of this work is to report the results of total pericystectomy as a guide to a hydatid cyst of the liver.</p> <p><b>Method:</b> This is a retrospective study of all cases of total pericystectomy performed in our center. An analysis of the following parameters was made: sex, age: seat, volume, number, cyst complication, intraoperative complications, intraoperative hemorrhage, morbidity, mortality, postoperative stay and long-term follow-up.</p> <p><b>Results:</b> Out of a total of 413 liver hydatid cysts, 81 (19.6%) patients underwent radical treatment, including 67 (16.2%) total pericystectomies. These patients had a single cyst in 41 cases, a double localization in 11 patients and three or more in 15, totalizing 99 cysts. The site of the cyst was peripheral 51 times and central in 38 cases. 14 patients had a complicated cyst (22%). A total of 78 pericystectomies were performed. Intraoperative complications included 3collapsus secondary to haemorrhage, 2 diaphragmatic breaches and 1 duodenal wound. The intraoperative haemorrhage was on average 200cc (150-1000cc). The pericystectomy was carried out after laparotomy 39 times and through laparoscopy 37 times. An associated gesture was performed in 12 patients (18%). Morbidity and mortality were 13.5% and 1.5%, respectively. The complications were dominated by 2 subphrenic and 3 parietal collections. The mean overall postoperative stay was 11 days, 24 days for patients with complications and 7 days for those with simple follow-up.</p> <p><b>Conclusion:</b> Although not possible in all patients, pericystectomy is the intervention of choice for a hydatid cyst of the liver whenever possible. The main criteria to be respected are an intervention with minimal haemorrhage, without transfusion and mortality equal to or lower than that of conservative treatment.</p>										

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4<sup>th</sup> – 7<sup>th</sup> OCTOBER, 2017

ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Ple2		Video		Poster	
Title	Management of hydatid cholangitis									
Authors	OUAHAB ILHEM <sup>1</sup> ; BEHAR ABDELAZIZ <sup>1</sup>									
Affiliation	1. Department of General Surgery. UHC of Setif. Algeria. <a href="mailto:dr_ouahabilhem@yahoo.fr">dr_ouahabilhem@yahoo.fr</a>									
ABSTRACT O_Par2_4										
<p><b>Aims.</b> The hydatid cyst of the liver (HCL) is a parasitic disease due to the development of <i>Echinococcus granulosus</i>. Complications are frequent and dominated by infection and rupture especially in the biliary tract, peritoneum and thorax. The cysto-biliary relations condition the clinical anatomical evolution of HCL. The evolutionary state of the cyst, its volume and its seat are the factors of compromise of the bile ducts intra and extra liver. The rupture of the LHC in the bile ducts will lead to a hydric congestion and then jaundice (cholangitis). Hydatid cholangitis is considered as a surgical emergency. In this study, we report our experience of management of ruptured liver hydatid cyst in the biliary tract as a function of the anatomical characteristics of the broken HCL and the complexity of the surgical treatment and to evaluate the results.</p> <p><b>Methods.</b> It is a descriptive and analytical study of liver hydatid cyst ruptured in the bile ducts causing cholangitis. This retrospective study is carried out over a period of 7 years and 4 months from 1 January 2010 to 30 April 2017 and covers all patients undergoing surgery, UHC of Setif in Algeria for a hydatid cyst of the liver. The analysis focused on sex, age, social environment, and distribution of broken LHK localization, surgical technique, complication and progression of operated patients.</p> <p><b>Results.</b> Thirty seven patients operated for HCL ruptured in the biliary tract. A male predominance was noted. An average age of 27 years with extremes ranging from 19 to 47 years was observed. Ultrasound revealed complicated HCL in 41% of cases and computed tomography in 59% cases. Total pericystectomy was performed in 78% and total subcutaneous in 22% of cases. External biliary drainage was performed in all patients. The surgical follow-up was simple except for 5 cases of wound infection.</p> <p><b>Conclusion.</b> The hydatid cyst of the liver is a benign, but potentially life-threatening condition due to its complications. Opening HCL in the biliary tract is the most frequent complication and poses a problem of definition and complexity of management.</p>										

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4<sup>th</sup> – 7<sup>th</sup> OCTOBER, 2017

ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral		Session	Par2		Video	X	Poster	
Title	Laparoscopic treatment of right hepatic hydatidosis with spleno-renal involvement									
Authors	<u>AISSA BENSLIMANE</u> , NOURREDINE CHADLI, ABDELKADER BENAOU, HABIB LARBI, ABDELKADER MENASRIA, ANOUAR REMINI, ABDENOUR BELKADI, NASREDINE TAHLAITI, OMAR TILIOUA, MOHAMED BOUBEKEUR.									
Affiliation	Department of General and Laparoscopic Surgery, Pôle EHU Oran, Algeria <a href="mailto:pr.boubekeur@hotmail.com">pr.boubekeur@hotmail.com</a>									
ABSTRACT O_Par2_5										
<p>Extra hepatic hydatid sites are less commonly encountered, especially when it is a combined localization, right renal and splenic.</p> <p>This film shows the case of a 25 years-old woman who had this renal-splenic involvement. The intervention was carried out by laparoscopic three-trocar. She underwent a conservative treatment, by resection of the protruding dome, with drainage at the end of the intervention, the postoperative course was simple and the patient left the 4th day.</p>										

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4<sup>th</sup> – 7<sup>th</sup> OCTOBER, 2017

ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par2		Video		Poster	
Title	Cystic echinococcosis: Rare cases of extrahepatic and extrapulmonary locations.									
Authors	BENFREDJ MYRIAM, LETAIEF FATEN, MOSBAHI SANA, MAKHLOUF DORAF, EZZI AZIZA, HIDOURI SAIDA, BELHASSEN SAMIA, KSIAA AMINE, SAHNOUN LASSAAD; MEKKI MONGI, BELGHITH MOHSEN, NOURI ABDELLATIF									
Affiliation	Pediatric Surgery Unit, UH Fattouma Bourguiba Monastir, Tunisia <a href="mailto:myriam.benfredj@yahoo.fr">myriam.benfredj@yahoo.fr</a>									
ABSTRACT O_Par2_6										
<p><b>Background and Aims:</b> To present our experience in extrahepatic and extrapulmonary hydatidosis.</p> <p><b>Methods:</b> A retrospective study of 12 cases of aberrant location of hydatid cyst, which were admitted to our departments from January 2007 to April 2017.</p> <p><b>Results:</b> 11 patients with 9 different locations of the hydatid cyst were admitted to the department. The mean age of the patients was 9.8 years, with a range between 3.5 and 16 years. Half the patients (50%) had concomitant hepatic localization. The hydatid cyst affected the spleen in 3 cases, the kidney in 3 cases, the psoas in 1 case, the brain in 1 case, the heart in 1 case, the spermatic cord in 1 case and peritoneal cavity in 2 cases. The diagnosis was made on the ultrasound and the computed tomographic urography. HEchinococcus spp. serology was positive for all patients. Regarding the parietal, heart and spermatic cord location, the medical treatment was successful. The surgery was required for the other locations (9 patients). A coelioscopic surgery was performed in 6 cases. The median follow up was 5.9 years. No recurrence was detected.</p> <p><b>Conclusion:</b> Conservative techniques are required in case of multiple hydatid disease. The parietal location has a good prognosis. The surgical treatment is the golden standard for the intra-abdominal locations such as spleen and kidney.</p>										

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4<sup>th</sup> – 7<sup>th</sup> OCTOBER, 2017

ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par2		Video		Poster	
Title	Hydatid Pulmonary Hypertension: review of two cases									
Authors	DJANET HAKEM <sup>1</sup> , NABILA SLIMANI <sup>1</sup> , SAIDA MÉDAOUD <sup>1</sup> , AKILA AGRANIOU <sup>1</sup> , RACHIDA YAHYAOU <sup>2</sup> , ZAKIA BENOU <sup>3</sup> , MESSAD KRIM <sup>3</sup> , SAMIR AYAT <sup>3</sup> , RAFIKA BOUGHRAROU <sup>3</sup> , BOUDJEMAA MANSOURI <sup>3</sup> , RABEH AMRANE <sup>2</sup> , AZIZA FISSAH <sup>2</sup> , SALAHEDDINE BOUREZAK <sup>4</sup> , KARIMA ACHOUR <sup>5</sup> , ABDELKRIM BERRAH <sup>1</sup>									
Affiliation	1Internal Medicine, 2, Pneumology, 3Radiology, 5 Thoracic surgery : Dr Mohammad-Lamuine Debaghine Hospital Bab-El-Oued's University Hospital Center; 3 Cardiology Beni-Messous University Hospital Center; 4 Cardiac Surgery Center, Birmourad Rais; Algiers, Algeria <a href="mailto:hakem_dj@yahoo.fr">hakem_dj@yahoo.fr</a>									
ABSTRACT O_Par2_7										
<p><b>Background:</b> Cardiac hydatidosis is a rare and serious localization which can complicate of an arterial hypertension pulmonary (PH) consequence of a secondary pulmonary embolism (PE) in the rupture of the hydatid cysts (HC) in the right cardiac cavities or a fistulization of a hepatic HC in the inferior vena cava (IVC).</p> <p><b>Methods:</b> To review 2 case reports to illustrate a unusual etiology of PH</p> <p><b>Case report 1:</b> 37 years old woman is investigated a lung and renal syndrome mimicking ANCA vasculitis. Medical history begins a few weeks rather with a acute dyspnoea with high suspicion of PE disease and leading to the diagnosis of a release of pulmonary ball. The degradation of the renal function requiring 9 sessions of hemodialysis which allows to get back the renal function. An bilateral pulmonary embolism at the origin of a pulmonary hypertension (PH) is observed in the following up. The cardiac MRI make the diagnosis of HC localized in the right ventricle complicated with a hydatid pulmonary embolism. Liver scanner tomography imaging does not localize HC at the hepatic level nor at the level of the IVC. The patient receives a symptomatic treatment and is transferred in thoracic and cardiac surgery.</p> <p><b>Case report 2:</b> 27-year-old man in the history of bilateral lungwort hydatidosis witch was operated three years among develops and PE revealed by an acute dyspnoea and a hemoptysis. The data of the thoracic angioscan confirms an secondary bilateral massive PE in the rupture of a cardiac HC of the right ventricle. So the patient benefits a cardiac surgery (cystectomy) under extracorporeal circulation.The immediate course is favorable. However in 3 months of the intervention the patient is seen again for a dyspnoea stage III of NYHA with signs of right-sided heart failure. The cardiac echo-Doppler ultrasound method objectifies 80 mm Hg of pulmonary arterial systolic pressure) and note dilatation of the right cavities. The cardiac MRI does not objectives local recurrence of the hydatid disease.</p> <p><b>Conclusion:</b> PH is dramatic complication of the rupture of the HC of the right ventricle and aggravates the prognosis of this still endemic multifocal disease proving a systematic cardiac exploration (MRI) associated in abdominal vascular exploration to verify the vacuity of the IVC in all hydatidosis.</p>										

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# XXVII WORLD CONGRESS OF ECHINOCOCCOSIS

4<sup>TH</sup> – 7<sup>TH</sup> OCTOBER, 2017

ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par2		Video		Poster	
Title	Hydatid embolisms of pulmonary artery									
Authors	ABDELKRIM SAAOUI, SIHAM DAHEL, OMAR ZEBAIR, TAYEB DERAZ, KAIS SAADA, ALI AMEZIANE BELHAMRI, KARIMA ACHOUR									
Affiliation	Department of thoracic surgery; University Hospital of Lamine Debaghine ex-Maillot, Algiers, Algeria <a href="mailto:achour.karima@gmail.com">achour.karima@gmail.com</a>									
ABSTRACT O_Par2_8										
<p><b>Background and Aims:</b> Hydatid disease is a frequent pathology in the Maghreb countries (Morocco, Algeria, Tunisia). It is a benign disease which may have very aggressive behaviour and course. Normally it becomes symptomatic when there is a complication like intra bronchial rupture or infection. Clinical presentation is variable depending on location and needs different management. We present a very rare case of multiple unilateral hydatid emboli occurred in right pulmonary artery of a patient with history of operated renal hydatid cyst.</p> <p><b>Case report:</b>A 31 years-old male patient presented with right sided flank pain. Sonography, MRI and Pet-scan showed a ruptured hydatid cyst in secretory system of a unique right kidney. It made compressive effect causing hydronephrosis. Resection in Urology Department was followed by infection necessitating two other surgical interventions.</p> <p>Six months later simple chest radiography revealed a marked augmentation of right pulmonary artery size. Right sided massive pulmonary artery embole of hydatid vesicles was demonstrated by thoracic angio-scanner. Abdominal CT-scan showed a calcified mass which partially obstructed the right renal pelvis and communicated with the renal vein.</p> <p>Right pneumonectomy was performed. Post-operative course was complicated by a cavitary empyema due to <i>Pseudomonas aeruginosa</i> and <i>Achromobacterxylosoxidans</i>, managed successfully by double drainage and frequent lavage. The patient was discharged on 43rd postoperative day.</p> <p><b>Conclusion:</b> To our knowledge only one similar case of this rare entity requiring a pneumonectomy has been observed. The supposed explication is rupture of the cyst into the renal vein but the right unilaterality of disease in both cases is questioning and remains a mystery to us.</p>										

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# XXVII WORLD CONGRESS OF ECHINOCOCCOSIS

4<sup>th</sup> – 7<sup>th</sup> OCTOBER, 2017

ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par3		Video		Poster	
Title	HERACLES collaborative and translational project: current achievements									
Authors	ADRIANO CASULLI, MAR SILES-LUCAS, MICHAELA CARMEN-MICHAELA CRETU, KAMENA VUTOVA, OKAN AKHAN, GULAY VURAL, ARANTXA CORTÉS, MICHELA RENZULLI, FRANCESCA TAMAROZZI, ENRICO BRUNETTI									
Affiliation	WHO Collaborating Centre for the epidemiology, detection and control of cystic and alveolar echinococcosis, Department of Infectious Diseases, Istituto Superiore di Sanità, Rome, Italy. European Reference Laboratory for Parasites, Department of Infectious Diseases, Istituto Superiore di Sanità, Rome, Italy. <a href="mailto:adriano.casulli@iss.it">adriano.casulli@iss.it</a>									
ABSTRACT O_Par3_1										
<p><b>Background and Aim:</b> Cystic Echinococcosis (CE) is one of the most important zoonotic diseases worldwide and was recently assigned to the list of the Neglected Tropical Diseases prioritized by the WHO. Tools for its diagnosis and treatment are currently not standardized, partly due to the complex and chronic evolution of CE and lack of funding to support prospective multicenter clinical trials, which in turn make data on this infection poorly framed and evidence supported, resulting in yet more neglect. HERACLES is a EU funded collaborative project (2013-2018) that offers for the first time a reasonable amount of funding and a real chance to break this vicious circle, promoting prospective studies on CE.</p> <p><b>Methods and Materials:</b> The main goals of the HERACLES cooperative project are to: Identify the population affected by CE in Bulgaria, Romania and Turkey by ultrasound screening; create the European Register of CE (ERCE); establish the Echino-Biobank from animal and human CE patients; set-up and validate new molecular-based PoC-LoC kits based on recombinant antigens; identify cyst stage-specific biomarkers associated with CE response to therapy or lack thereof, through “omic” studies; increase drug bioavailability of benzimidazoles; train experts working in Eastern European countries, as they are crucial to fight this disease.</p> <p><b>Results:</b> Current core achievements are: 1) Creation of the HERACLES Extended Network with more than 50 centers from Europe and Asia (<a href="http://www.heracles-fp7.eu/interactive_map.html">http://www.heracles-fp7.eu/interactive_map.html</a>); 2) Completion of the biggest research-based cross-sectional study (ultrasound-based) on CE ever done at global level (N=24,693); 3) Creation of the European Register (N=1,359) as a case series for data analysis on clinical management of CE (<a href="http://www.heracles-fp7.eu/erce.html">http://www.heracles-fp7.eu/erce.html</a>); 4) European patent obtainment on anti-parasitic soluble drugs: “Salts of benzimidazole compounds”; 5) creation of the Echino-Biobank repository to sustain experimental and clinical research in this field (N≈4,500 samples); 6) Worldwide collection of human cyst samples for genotyping studies (N=742); 7) First proteomic description of parasite exosomes in fertile hydatid cyst fluid; 8) Scientific papers published in peer reviewed journals: 36.</p> <p><b>Conclusion:</b> The results from HERACLES will support governments, organizations (WHO), European Commission, related European agencies (ECDC, EFSA) and the Global Burden of Disease study (IHME) to harmonize data collection, monitoring and reporting of CE. We see this as</p>										

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**4<sup>th</sup> – 7<sup>th</sup> OCTOBER, 2017**

**ALGIERS, ALGERIA**

breakthrough in the current scenario of CE.

The research was funded from the European Community's FP7 under the grant agreement 602051 (Project HERACLES; <http://www.Heracles-fp7.eu/>).

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## XXVII WORLD CONGRESS OF ECHINOCOCCOSIS

4<sup>th</sup> – 7<sup>th</sup> OCTOBER, 2017

ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	<input checked="" type="checkbox"/> X	Session	Par3	<input type="checkbox"/>	Video	<input type="checkbox"/>	Poster	<input type="checkbox"/>
Title	Clinical findings from the extended ultrasound screening in TURKEY for cystic echinococcosis (HERACLES project)									
Authors	OKAN AKHAN, FRANCESCA TAMAROZZI, DEVRIM AKINCI, TURKMEN CİFTÇİ, SERRA ORSTEN, ENRICO BRUNETTI, ADRIANO CASULLI									
Affiliation	Department of Radiology, Faculty of Medicine, Hacettepe University. <a href="mailto:akano@tr.net">akano@tr.net</a>									
<b>ABSTRACT O_Par3_2</b>										
<p><b>Background and Aim:</b> The aim of the present study was to obtain extensive data on prevalence of abdominal CE in rural areas, where the local population is active with animal breeding, being in close contact with sheep, cattle, dogs etc., thus presenting with high risk factors for CE, and previous information on the prevalence of the disease is limited. This research was conceived under HERACLES project, 7<sup>th</sup> Framework Programme of the European Commission.</p> <p><b>Material and Methods:</b> Six locations with different geographical and epidemiological properties were determined for screening, which include Çubuk district of Ankara province and Sultanhanı district of Aksaray province (Central Anatolia), Uzunköprü district of Edirne province and İvrindi district of Balıkesir province (Marmara Region), Akçakale district of Şanlıurfa province (Southeastern Anatolia) and Tatvan district of Bitlis province (Eastern Anatolia) were investigated. The presence of CE was assessed by ultrasonography (US). Subjects of living in the target provinces were invited to participate. Before US examination, participants were registered and informed about the disease and US examination using the Participant Information Sheet. The World Health Organization Informal Working Group on Echinococcosis (WHO-IWGE) classification was used to determine stage of CE cysts, according to the study protocol. Every case was examined independently by two radiologists.</p> <p><b>Results:</b> A total of 8,624 participants were screened by US in the all regions. By province, 3,122 people (36.23%) screened in Aksaray, 2,037 (23.64%) in Balıkesir, 1,096 (12.72%) in Edirne, 847 (9.83%) in Şanlıurfa, 773 (8.97%) in Bitlis, and 743 (8.62%) in Ankara. The majority of participants were female (4,801/8,624; 55.6%). A total of 97 CE or reported a history of treatment for CE patients were detected. Of these, 46 were diagnosed for the first time during the US survey. CE lesions were detected in most frequently in the liver (96.97%) and most of them classified in inactive stages (CE4 and CE5) (79/105; 75.2%). Combining subjects that had CE in the past or currently, the adjusted unconservative prevalence was 1.02% (95% CI 0.40-2.58). Other incidental findings were gallstones (n=14), kidney simple cysts/polycystic kidney (n=10), hepatic haemangioma (n=2), ovarian cyst (n=1) and images compatible with chronic pyelonephritis (n=1) and chronic cholecistitis (n=1).</p> <p><b>Conclusion:</b> Transmission of CE has been demonstrated in all regions studied. To best of our knowledge, our study, the largest of this type ever conducted in Turkey and our results will be of use for disease burden studies and to support public health interventions.</p> <p>This research received funding from the European Community's FP7 under the grant agreement 602051 (Project HERACLES; <a href="http://www.heracles-fp7.eu/">http://www.heracles-fp7.eu/</a>).</p>										

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# XXVII WORLD CONGRESS OF ECHINOCOCCOSIS

4<sup>th</sup> – 7<sup>th</sup> OCTOBER, 2017

ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par3		Video		Poster
Title	Clinical findings from the extended ultrasound screening in ROMANIA for cystic echinococcosis (HERACLES project)								
Authors	CARMEN-MICHAELA CRETU, PATRICIA MIHAILESCU, LOREDANA GABRIELA POPA, CORINA MANUELA CONSTANTIN, COSMIN ALEXANDRU POPA, BOGDAN MASTALIER, MIRCEA BEURAN, CLAUDIA ISTRATE, FRANCESCA TAMAROZZI, ENRICO BRUNETTI, ADRIANO CASULLI								
Affiliation	Carol Davila University of Medicine and Pharmacy, Bucharest, Romania; <sup>2</sup> Colentina Clinical Hospital, Bucharest, Romania. Eco-Para-Diagnostic SRL, Bucharest, Romania. <a href="mailto:michaelacarmen.cretu@gmail.com">michaelacarmen.cretu@gmail.com</a>								
ABSTRACT O_Par3_3									
<p><b>Background and Aim:</b> Cystic echinococcosis (CE) is common in the Balkan region. In Romania many CE cases are diagnosed in hospitals, but the limited case notification makes it difficult to estimate the real burden of infection. This study is aiming to describe clinical findings during the ultrasound screening performed in the context of HERACLES project in the rural areas of Romania.</p> <p><b>Material and Methods:</b> After informing local authorities and doctors, study materials (flyers, brochures and patient's information sheets) were distributed. In villages, the team coordinator informed the population about CE and the benefits and risks of the study. After signing the informed consent form, volunteer participants were examined by US; an epidemiological questionnaire was also administered. CE or suspect CE cases were analyzed by 2 physicians during the screening and classified according to the WHO-IWGE (Informal Working Group on Echinococcosis) expert consensus. All cases were re-evaluated before data analysis. Other detected pathologies were notified, clinical counseling provided, and local general practitioners informed. After the screening, CE patients were invited to hospital to complete investigations if required.</p> <p><b>Results:</b> During 2014-2015, 7,467 persons, from 5 counties/28 villages, were screened for abdominal CE. Hundred and thirty subjects with CE/suspect lesions were found. Of those, in 28 the diagnosis of CE was excluded, 29 patients were newly diagnosed with abdominal CE (13 of whom with cysts in active stage), 41 had a history of treatment for CE (of whom 6 still had CE cyst on US, all in inactive stage with the exception of 1 patient), and 28 had CL or suspect solid lesions. An overall CE adjusted prevalence of 0.42% has been found by abdominal ultrasound in the rural areas of Romania.</p> <p><b>Conclusion:</b> New cases with cysts in active stages were identified in all age groups, showing the perpetuation of the life cycle in villages. Health education should be implemented to improve awareness and knowledge regarding this disease by the at-risk population. Regular deworming of shepherd dogs should be encouraged by veterinarians. The results of our study will give a more reliable picture of the burden of this disease in Romania and will be of help for the evaluation by health authorities to establish a National Surveillance and Control Program for this preventable infection.</p> <p>This research received funding from the European Community's FP7 under the grant agreement 602051 (Project HERACLES; <a href="http://www.heracles-fp7.eu/">http://www.heracles-fp7.eu/</a>).</p>									

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# XXVII WORLD CONGRESS OF ECHINOCOCCOSIS

4<sup>th</sup> – 7<sup>th</sup> OCTOBER, 2017

ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par3		Video		Poster	
Title	Clinical findings from the extended ultrasound screening in BULGARIA for cystic echinococcosis (HERACLES project)									
Authors	KAMENA VUTOVA, BRANIMIR GOLEMANOV, EMILIA ALEKSANDROVA, VENCISLAV KRASTEV, VALERI VELEV, ROSITZA CHIPEVA, NINA YANCHEVA, MARIN MUHTAROV, FRANCESCA TAMAROZZI, ENRICO BRUNETTI, ADRIANO CASULLI									
Affiliation	SBALIPB "Prof. I. Kirov", Department of Infectious Diseases, Parasitology and Tropical Medicine, Medical University – Sofia. <a href="mailto:k_vutova@abv.bg">k_vutova@abv.bg</a>									
ABSTRACT O_Par3_4										
<p><b>Background and Aim:</b> Cystic echinococcosis (CE) is a major health and economic problem in many areas of the world. High incidence of CE reported in Southern and Eastern Europe was a reason to support HERACLES international project funded by the Seventh Framework Programme (FP7) of the European Commission. This study is aiming to describe clinical findings during the ultrasound screenings performed in the context of HERACLES project in the rural areas of Bulgaria.</p> <p><b>Material and Methods:</b> Study materials (flyers, brochures and patient’s information sheets) were distributed to local authorities, health services and citizens. Abdominal ultrasound (US) for CE detection was performed on 8,602 people in four Bulgarian regions endemic for CE over a two-year period (2014-2015). Patients with CE were followed after 12, 18, and 36 months. WHO-IWEGE (Informal Working Group on Echinococcosis) expert consensus was adopted for the detection and the clinical management of CE cases.</p> <p><b>Results:</b> During the US screenings 31 persons were diagnosed by imaging with abdominal CE, while additional 50 people were reporting a clinical history of treatment for CE but had no detectable CE cysts. Of patients with CE cysts, 17, of whom 7 with cysts in active stages, did not know about their infection. Forty-one patients received treatment for CE in the past and still had visible CE cysts on US; 6 of these patients had cysts in active stage, but unfortunately it was not possible to ascertain if these were relapses or new infections due to the lack of medical documentation. An overall not adjusted CE prevalence of 0.38% has been found by abdominal ultrasound in the rural areas of Bulgaria.</p> <p><b>Conclusion:</b> This is the first extended US screening for CE carried out in Bulgaria. Collection and analysis of epidemiological and clinical data will give a more reliable picture of the burden of this disease in Bulgaria, providing a statistically supported case series for future evaluation of efficacy and effectiveness of interventions.</p> <p>This research received funding from the European Community’s FP7 under the grant agreement 602051 (Project HERACLES; <a href="http://www.heracles-fp7.eu/">http://www.heracles-fp7.eu/</a>).</p>										

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# XXVII WORLD CONGRESS OF ECHINOCOCCOSIS

4<sup>th</sup> – 7<sup>th</sup> OCTOBER, 2017

ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par3		Video		Poster
Title	Extended ultrasound population surveys in TURKEY, ROMANIA and BULGARIA: a cross-sectional study (HERACLES project)								
Authors	ADRIANO CASULLI, FRANCESCA TAMAROZZI, CARMEN-MICHAELA CRETU, KAMENA VUTOVA, OKAN AKHAN, MASSIMO FABIANI, PATRIZIO PEZZOTTI, MAR SILES-LUCAS, ENRICO BRUNETTI								
Affiliation	WHO Collaborating Centre for the epidemiology, detection and control of cystic and alveolar echinococcosis, Department of Infectious Diseases, Istituto Superiore di Sanità, Rome, Italy. European Reference Laboratory for Parasites, Department of Infectious Diseases, Istituto Superiore di Sanità, Rome, Italy. <a href="mailto:adriano.casulli@iss.it">adriano.casulli@iss.it</a>								
ABSTRACT O_Par3_5									
<p><b>Background and Aim:</b> Cystic echinococcosis (CE) global prevalence is estimated at 2–3 million human cases with a burden of 1 million DALYs accounting for underreporting. However, clinically diagnosed cases represent only a small proportion of the total number of real infected people. For these reasons, extended ultrasound (US) surveys on human populations are needed to quantify asymptomatic carriers and allow a more precise estimate of CE burden. Such efforts are crucial to assess, compare and prioritize interventions in limited resource settings. A study of prevalence of abdominal CE was undertaken in Eastern European (EE) and adjacent countries (AC) under the framework of HERACLES project.</p> <p><b>Materials and Methods:</b> Sixteen extended ultrasound population surveys were conducted in association with resident partners and public health centres: Hospital of Infectious and Parasitic Diseases ‘Prof. J. Kirov’ (Sofia, Bulgaria), Colentina Clinical Hospital (Bucharest, Romania), Hacettepe University Hospital (Ankara, Turkey). Ethical approvals and informed consents were obtained accordingly. Each suspected case was examined independently by 2 clinicians and patients were assigned to treatment according to WHO-IWGE (Informal Working Group on Echinococcosis) Expert Consensus.</p> <p><b>Results:</b> 24,693 people (8,602 in Bulgaria, 7,467 in Romania and 8,624 in Turkey) were screened during 2014 and 2015, with 249 individuals identified with CE. Among these patients, 119 were identified by imaging as having identifiable abdominal CE and 130 reported a history of treatment for CE but didn’t have identifiable CE cysts on US at the moment of screenings. A total abdominal CE prevalence of 0.51% (by imaging) and 0,95% (when considering also past history of CE) has been detected in the rural endemic areas of these three countries.</p> <p>A model (standardized by age and gender) of the total population affected by CE living in rural areas of Bulgaria, Romania and Turkey has been generated. We estimate around 147,000 individuals infected by CE in these rural areas.</p> <p><b>Conclusion:</b> Collection of accurate epidemiological and clinical data will give a reliable picture of the burden of this disease, providing a statistically supported case series for future evaluation of efficacy and effectiveness of interventions. This is the largest US survey (research-based cross-sectional study) on CE from a single community-based study.</p> <p>This research received funding from the European Community’s FP7 under the grant agreement 602051 (Project HERACLES; <a href="http://www.heracles-fp7.eu/">http://www.heracles-fp7.eu/</a>).</p>									

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# XXVII WORLD CONGRESS OF ECHINOCOCCOSIS

4<sup>th</sup> – 7<sup>th</sup> OCTOBER, 2017

ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par3		Video		Poster
Title	The European Register of Cystic Echinococcosis (ERCE): where are we and where to go (HERACLES project)								
Authors	FRANCESCA TAMAROZZI, PATRIZIA ROSSI, FABIO GALATI, AMBRA VOLA, OKAN AKHAN, CARMEN-MICHAELA CRETU, KAMENA VUTOVA, MAR SILES-LUCAS, ANDREA ANGHEBEN*, FILIPPO BARTALESI* MONCEF BELHASSEN GARCIA*, SEBASTIAN BORYS*, FABRIZIO BRUSCHI*, GUIDO CALLERI*, LEONARDO CHIANURA*, BALAZS DEZSENYI*, MARIA TERESA GIORDANI*, VALBONA GJONI*, LEVAN GOGICHAISHVILI*, DELIA GOLETTI*, MAJID FASIHI HARANDI*, EMMA LAPINI*, FAZAL KARIM*, GUIDO MENOZZI*, SCILLA MASTRANDREA*, MICHAEL RAMHARTER*, ALFONSO RECORDARE*, ANTONELLA TEGGI*, CARLO TORTI*, GIUSTINA VITALE*, ENRICO BRUNETTI, ADRIANO CASULLI * HERACLES extended network								
Affiliation	Department of Clinical Surgical Diagnostic and Pediatric Sciences; University of Pavia, Pavia, Italy. WHO Collaborating Centre for the Clinical Management of Cystic Echinococcosis, Pavia, Italy. f_tamarozzi@yahoo.com								
ABSTRACT O_Par3_6									
<p><b>Background and Aim:</b> The European Register of Cystic Echinococcosis (ERCE) was launched in 2014 within the HERACLES project. ERCE is an online prospective, observational, multicentre register of patients with probable or confirmed CE. ERCE was originally created as a tool for the surveillance of human CE; allowing national and international authorities to acknowledge the magnitude of the problem by reporting cases otherwise not captured by official systems, built to take into account the peculiar features of the infection, and to establish a prospective case retrieval to evaluate the evolution of individual cysts. Here we will discuss the achievements of ERCE to date and its future development.</p> <p><b>Materials and methods:</b> The ERCE database was searched (30<sup>th</sup> August 2017) and data concerning the number of registered patients; the registration of patients in the past 18 months; the record of follow-up visits and the record of CE cyst details were analysed for each adhering centre.</p> <p><b>Results:</b> Thirty centres in 12 countries (of which five extra-European) were adhering to ERCE. Of these; 27 (79%) registered patients and; of these; 17 (63%) recorded at least one visit occurring within the past 18 months. A total of 1,359 patients were registered; ranging from 1 to 377 per centre. Fourteen centres (51.8% of centres ever having recorded patients in ERCE) recorded also follow-up visits after those corresponding to the first patient’s recording in ERCE. In these centres; a median of 24.7% patients also had follow-up visits recorded in ERCE. The cysts characteristics (location and stage) were recorded at least for some patients by 20 centres. In these centres; cysts characteristics were recorded for 62% (range 12%-100%) of registered patients.</p> <p><b>Conclusion:</b> In accordance to the objectives individuated by the renewed WHO-IWGE; ERCE will offer a prototype register structure to harmonize data collection and reporting of CE; including data on the pivotal clinical features of the infection. The monitoring of quality of data recorded and frequency of usage will drive a constant revision and improvement of ERCE; to provide the scientific community with a useful and user-friendly tool; able to collect prospectively reliable data for drawing valid recommendations from observational evidence in the virtual absence of randomized clinical trials on CE.</p> <p>The research was funded from the European Community’s FP7 under the grant agreement 602051 (Project HERACLES; <a href="http://www.Heracles-fp7.eu/">http://www.Heracles-fp7.eu/</a>).</p>									

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4<sup>th</sup> – 7<sup>th</sup> OCTOBER, 2017

ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par3		Video		Poster	
Title	The Echino-Biobank: a new tool for the validation of serological tests (HERACLES project)									
Authors	MAR SILES-LUCAS, CARLOS SANCHEZ-OVEJERO, RAÚL MANZANO ROMÁN, AINEL ALEMÁN, FERNANDO MORCILLO, EYLEM ADÜRK, OKAN AKHAN, ENRICO BRUNETTI, <u>FRANCESCA TAMAROZZI</u> , MARA MARICONTI, CARMEN-MICHAELA CRETU, KAMENNA VUTOVA, GULAY VURAL, ADRIANO CASULLI									
Affiliation	Parasitology Unit; Instituto de Recursos Naturales y Agrobiología de Salamanca; IRNASA-CSIC; Cordel de Merinas 40-52; 37008; Salamanca; Spain. <a href="mailto:mmar.siles@irnasa.csic.es">mmar.siles@irnasa.csic.es</a>									
ABSTRACT O_Par3_7										
<p><b>Background and Aim:</b> This tool is aiming to generate a repository of samples to standardize reserach in the field of bio-medical reaserarch of cystic echinococcosis.</p> <p><b>Material and Methods:</b> The Echino-Biobank was officially registered in March 2015 fulfilling the EU law for biobanking; and hosted at the IRNASA-CSIC in Salamanca (Spain). By May 2017; the biobank has received samples from people screened during HERACLES in Turkey; Bulgaria and Romania (serum; plasma; plasma in DMSO; buffy coat and cyst material); including 378 controls; 104 cystic echinococcosis (CE) patients and 125 post-surgical patients; from prospective patients visited in Italy; Turkey and Romania (285 patients); and from retrospective patients lost for follow-up visited in Italy (299 patients). Animal samples from Turkey and Spain have also been received; including serum and cyst material (sample n=246). Samples are linked with their respective clinical data through the two databases developed during HERACLES (ERCE and CYSTRACK). Additionally; eight recombinant antigens produced at the IRNASA-CSIC; named B1t; B2t; 2B2t; Ag5t; MDH; CaBP; AFFP and DiPol; produced during HERACLES; are also available.</p> <p><b>Results:</b> The Echino-Biobank received around 4,500 samples and has provided to eight institutions working in CE for a total of 1,500 samples. Italian (Pavia) retrospective serum samples have been used for the validation of the abovementioned recombinant antigens; in comparison with hydatid fluid (HF) in ELISA at the IRNASA-CSIC and in Virclia by Vircell SL. The best individual antigens (B1t; 2B2t and Ag5t) were used for the design and production of a multiantigenic recombinant protein called DiPol. This was also validated and compared with the individual antigens and the HF. GST-tagged antigens B1t; 2B2t; Ag5t and DiPol showed good diagnostic performance. In ELISA; ROC analysis showed the best AUC for the GST-2B2t antigen (0.933; 86.1% sensitivity and 90.1% specificity); outranging the performance of the HF (AUC=0.8) and the GST-DiPol recombinant antigen (AUC=0.906; 83.7% sensitivity and 89.2% specificity). In Virclia; the best performance was found for 2B2t and Ag5t. When recombinant antigens were tested for their ability to follow-up CE patients after treatment; B1t; 2B2t and DiPol showed better performance than HF; although still far from optimal.</p> <p><b>Conclusion:</b> The Echino-Biobank has shown to constitute a unique tool contributing to the advance in the field of CE. The new recombinant antigens have shown promising results for their use in</p>										

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**ALGIERS, ALGERIA**

commercial tests replacing HF. We have also demonstrated that the combination of defined regions of antigens B1; B2 and Ag5 in the single recombinant protein DiPol did not result in a better performance compared with the recombinant antigen 2B2t containing the antigen B2 repeated twice in a head to tail tandem.

This research received funding from the European Community's FP7 under the grant agreement 602051 (Project HERACLES; <http://www.heracles-fp7.eu/>).

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4<sup>th</sup> – 7<sup>th</sup> OCTOBER, 2017

ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par3	Video	Poster
Title	Proteomic investigation of exosomes from CE patients (HERACLES project)						
Authors	FEDERICA FRATINI, GIANFRANCO MACCHIA, LUCIA BERTUCCINI, CECILIA BIRAGO, ELISABETTA PIZZI, OKAN AKHAN, SERRA ORSTEN, CARMEN-MICHALELA CRETU, FRANCESCA TAMAROZZI, ENRICO BRUNETTI, MAR SILES-LUCAS, ADRIANO CASULLI						
Affiliation	WHO Collaborating Centre for the epidemiology, detection and control of cystic and alveolar echinococcosis, Department of Infectious Diseases, Istituto Superiore di Sanità, Rome, Italy. Proteomics Unit – Core Facilities, Istituto Superiore di Sanità, Rome, Italy. <a href="mailto:federica.fratini@iss.it">federica.fratini@iss.it</a>						
ABSTRACT O_Par3_8							
<p><b>Background and Aim:</b> One of the goals of the HERACLES Project is the study of the host-parasite relationship in cystic echinococcosis, to define new disease markers. In the last years a growing interest for exosomes (EXO) has emerged. Proposed to mediate cell/cell communication in patho/physiological conditions, nowadays EXO represent sensible biomedical research targets, deeply investigated for biomarker identification or drug delivery vehicles.</p> <p><b>Material and Methods:</b> Suitable methods to isolate and distinguish EXO from different plasma extracellular vesicles are required. Here we propose an efficient methodology, based on differential centrifugations and density gradients, to separate EXO from plasma, further characterized by transmission electron microscopy and quantitative proteomic analysis. Finally, we applied our approach for the discovery of Cystic echinococcosis (CE) biomarkers for diagnosis and viability definition.</p> <p><b>Results:</b> Our first ascertainment is that the method is very sensitive to individual variability, so that at least 25 subjects are necessary for proteomic pool analysis. Second, we didn't find any difference in the analysis of frozen plasma in our conditions. Third, our method allows to distinguish between proteins shared by several types of extracellular vesicles and proteins specifically enriched in EXO. Finally, the application of our method to CE patient plasma pools allowed to the identification of potential biomarker candidates.</p> <p><b>Conclusion:</b> CE is a chronic disease in humans and diagnosis is currently based on imaging (ultrasound) while serology is only supportive. CE blood biomarkers are strongly required for a fast diagnosis and this method represents a novel and promising approach for further studies on exosomes and biomarker discovery.</p> <p>This research received funding from the European Community's FP7 under the grant agreement 602051 (Project HERACLES; <a href="http://www.heracles-fp7.eu/">http://www.heracles-fp7.eu/</a>).</p>							

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ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par3		Video		Poster	
Title	Secondary cystic echinococcosis infection in animal model: preliminary results testing different drug formulations (HERACLES project)									
Authors	GULAY VURAL, MELEK KOCAK, MEHMET YARDIMCI, <u>TUBA OZGE YASAR ERKAL</u> , MAR SILES-LUCAS, EYLEM ADURK, ROBERTO CIRILLI, ADRIANO CASULLI									
Affiliation	Namik Kemal University; Veterinary Faculty; Department of Parasitology; Tekirdağ; Turkey. <a href="mailto:gvural@nku.edu.tr">gvural@nku.edu.tr</a>									
ABSTRACT O_Par3_9										
<p><b>Background and Aim:</b> To determine the parasitostatic effects of different formulations of Albendazole (ABZ) against <i>Echinococcus granulosus</i> cysts in an in vivo model based on susceptible and immunocompetent BALB/c mice.</p> <p><b>Material and Methods:</b> Secondary cystic echinococcosis was induced in female BALB/c mice (n=135) receiving intraperitoneal inoculation of viable protoscoleces. Infected mice were subsequently divided into 9 groups composed by 15 mice each. One year after the infection; 8 groups were administered with different drug formulations; while last group was kept as a control group (dosing placebo). Drugs and placebo were administrated to each mouse by gavage. Albendazole formulations were daily prepared at 10 mg/kg/mouse and administered (200 µL) to mice groups at the same time for 30 days.</p> <p>Groups were as follow: Group 1: ABZ (albendazole); Group 2: ABZSO (albendazole sulfoxid); Group 3: ABZ-Na (Na salt of albendazole; Patented); Group 4: ABZSO-Na (Na salt of albendazole sulfoxid; Patented); Group 5: (R)-ABZSO (enantiomer of albendazole sulfoxid) RBZ-1; Group 6: (S)-ABZSO (enantiomer of albendazole sulfoxid); Group7: (R)-ABZSO-Na (Na salt of enantiomer of albendazole sulfoxid; Patented); Group 8: (S)-ABZSO-Na (Na salt of enantiomer of albendazole sulfoxid; Patented); Group 9: Control. After last drug administration the peritoneal cavity was opened; cysts were carefully separated from each other and were removed and weighed. The diameter of the cysts was measured by ruler.</p> <p><b>Results:</b> According to preliminary results the most effective drug against cysts was ABZSO_R Na (Group 7; R enantiomer with patent); the second effective drug was ABZSO_R (Group 5; R enantiomer).</p> <p><b>Conclusion:</b> These preliminary results were based on macroscopic findings. The drugs' effect on parasitic cysts will be also evaluated by HPLC analysis for drug concentration in blood and scanning electron microscopic examination findings in different groups.</p> <p>This research received funding from the European Community's FP7 under the grant agreement 602051 (Project HERACLES; <a href="http://www.heracles-fp7.eu/">http://www.heracles-fp7.eu/</a>).</p>										

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4<sup>th</sup> – 7<sup>th</sup> OCTOBER, 2017

ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par3		Video		Poster
Title	Human cystic echinococcosis: epidemiology and genetic diversity using DNA extracted from metacestodes removed from confirmed patients (HERACLES project)								
Authors	BELGEES BOUFANA, SERRA ORSTEN, CARMEN-MICHAELA CRETU, PATRICIA MIHAILESCU, AKHAN OKAN, SAMIA LAHMAR*, HOURIA ZAIT*, THOMAS ROMIG*, TIAOYING LI*, KAMENNA VUTOVA, THOMAS JUNGHANSS*, HERBERT AUER*, ENRICO BRUNETTI, FRANCESCA TAMAROZZI, AMBRA VOLA, MARA MARICONTI, MONIKA DYBICZ*, MAJID FASIHI HARANDI*, AMER AL-JAWABREH*, DELIA GOLETTI*, EKATERINA ZHIRENKINA*, WIJDAN MERO*, AZAD MEERKHAN*, ZUBER ISMAIL*, MARA ROSENZVIT*, CORNELIS STIJNIS*, PIKKA JOKELAINEN*, BALÁZS DEZSÉNYI*, LOREDANA GABRIELA POPA, BOGDAN MASTALIER, COSMIN ALEXANDRU POPA, SEPTIMIU PETRUTESCU, MIRCEA BEURAN, SEBASTIAN VALCEA, NICOLAE LORDACHE, TÜRKMEN ÇİFTÇİ, DEVRİM AKINCI, WAEL REBAÏ*, HAMRIOUI BOUSSAD*, HASMIK GEVORGYAN*, DENNIS EBI*, MARIJA STOJKOVIC*, PIOTR KAROL BORKOWSKI*, SAEID NASIBI*, GIUSEPPE MARIA ETTORRE*, LINDA PETRONE*, LUCIA ROSALBA GRILLO*, HECTOR GABRIEL AVILA*, ALDERT BART*, HENRIK VEDEL NIELSEN*, ANDREA ANGHEBEN*, CSABA KOMJÁTHY*, FABRIZIO BRUSCHI*, BRANIMIR GOLEMANOV*, HRISTO SHIVACHEV*, ALEXANDER TCHERVENIAKOV, MAR SILES-LUCAS, ADRIANO CASULLI. * HERACLES extended network								
Affiliation	WHO Collaborating Centre for the epidemiology; detection and control of cystic and alveolar echinococcosis; Department of Infectious Diseases; Istituto Superiore di Sanità; Rome; Italy. European Reference Laboratory for Parasites; Department of Infectious Diseases; Istituto Superiore di Sanità; Rome; Italy. <a href="mailto:belgees.boufana@iss.it">belgees.boufana@iss.it</a>								
ABSTRACT O_Par3_10									
<b>Background and Aim:</b> 1) to confirm species/haplotypes infecting humans across several continents and investigate the intraspecific genetic diversity within and between populations of <i>Echinococcus granulosus</i> sensu latu (s.l.) using DNA extracted from metacestodes removed from surgically confirmed human cases. In addition; we aim to determine the population structure of <i>E. granulosus</i> s.l. and investigate evolutionary history through the generation of hypotheses on how this parasite has spread. 2) assess whether humans are susceptible to a specific haplotype?									
<b>Material and Methods:</b>									
<i>E. granulosus</i> s.l. METACESTODE ISOLATES									
A total of 742 hydatid cysts removed from surgically confirmed cases were included in this study. Patients originated from Africa (n=170); Asia (n=96); Europe ( n=281); the Middle East (n=190) and South America (n=5).									
COLLECTION AND PROCESSING OF ISOLATES									
Human CE isolates (protoscoleces and/or membranes) were collected at surgery and preserved in 95% ethanol for DNA extraction. Additionally; DNA extracted from formalin-fixed paraffin-embedded samples was also used. DNA was used to amplify the entire cytochrome <i>c</i> oxidase subunit 1 ( <i>COI</i> ) (1674bp) and the nicotinamide adenine dinucleotide dehydrogenase 1 ( <i>NADH1</i> ) (894bp) mitochondrial genes using published and in-house primers. Amplified products were commercially purified and sequenced using forward and reverse primers (Genewiz; Takeley; UK). Internal primers									

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ALGIERS, ALGERIA

were used to provide nucleotide sequence consensus.

### ANALYSIS OF GENETIC HETEROGENEITY

Due to expected polymorphisms within *E. granulosus* s.l. we based our investigation on the analysis of haplotypes. For an estimation of phylogenetic relationships between haplotypes we used MODELTEST to determine the likelihood model of DNA sequence evolution (Akaike information criterion) which was executed in PAUP. Arlequin was used to calculate population diversity indices (haplotype and nucleotide diversities); neutrality indices (Tajima's *D* and Fu's *F<sub>s</sub>*); and the degree of population differentiation using the pairwise fixation index (*F<sub>st</sub>*). HapView was used to generate haplotype networks using maximum likelihood trees constructed using DNAML program in PHYLIP.

### Preliminary results:

**ND1 gene:** To date we have successfully amplified the ND1 gene for 331/742 patients. We have designed new ND1 primers through which we aim to amplify the remaining DNA samples that we suspect may belong to other species of the *E. granulosus* s.l. species complex.

**COX1 gene:** Presently; we have amplified the CO1 gene for 148/742 using published primers. We are currently testing some in-house primers to complete CO1 amplification.

This research received funding from the European Community's FP7 under the grant agreement 602051 (Project HERACLES; <http://www.heracles-fp7.eu/>).

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4<sup>th</sup> – 7<sup>th</sup> OCTOBER, 2017

ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par4		Video		Poster	
Title	Echinococcosis / Hydatidosis in the North African countries: Situation and risk factors									
Authors	DAKKAK ALLAL									
Affiliation	Hassan II Institute of Agronomy and Veterinary Medicine, Rabat, Morocco. <a href="mailto:allaldakkak@gmail.com">allaldakkak@gmail.com</a>									
ABSTRACT I_Par4_1										
<p>Echinococcosis / hydatidosis (EH) is caused by the development of the larval stage of taeniid cestodes of the genus <i>Echinococcus</i> in various organs and tissues of man and livestock. Ruminants are the intermediate hosts of the parasite and the adult worms parasitize the small intestine of carnivores, mainly dogs (definitive host). EH is one of the most important parasitic zoonoses in the world. The Mediterranean region is one of the most endemic regions and its incidence is among the highest in livestock and humans in the North African countries. In these countries, <i>Echinococcus granulosus</i>, the causative agent of cystic echinococcosis (CE), is the main species of importance in relation to humans and to livestock. For the last three decades CE has been one of the most important zoonotic diseases and surgical incidences per 100,000 inhabitants of 0.05 to 2.6, 4.2 to 15.0, 12.7 to 15.0, 1.1 to 3.25, and 4.6 to 5.6 were reported respectively in Egypt, Libya, Tunisia, Algeria and Morocco. Cysts are located in the liver (70-80%), lungs (10-20%) and other organs and tissues (5%). Surgical cases represent only the tip of the iceberg, as reliable serological investigations in Egypt, Tunisia, Algeria and Morocco, showed prevalence of 6.1%, 37%, 4% and 18.64%, respectively. The prevalence of infestation of dogs is very high in the 5 countries. For 100 dogs, it is 1.8 to 16.0, 3.8 to 5.9, 4.4 to 68.4, 0.8 to 80.0 and 22.0 to 62.8 in Egypt, Libya, Tunisia, Algeria and Morocco respectively. The prevalence exceeded 20% in Tunisia, Algeria and Morocco and show, according to the WHO standards, that the disease is highly endemic in these countries. The intensity of infestation is very high and ranges from 25 to 28 450 parasites per infected dog. The prevalence of infestation is also very high in sheep, cattle, goats and dromedaries and varies from 7.8 to 23.1, 12.7 to 21.3, 10.1 to 14.3, 11.7 to 18.9 in Egypt, from 1.8 to 33.4, 1.0 to 13.9, 0, 0 to 18.0 and 1.4 to 40.0 in Libya, 5.0 to 96.0, 13.0 to 18.1, 1.1 to 2.3 and 10.1 to 12.0 in Tunisia, 89.0, 24.8, 3.7 and 25.0 in Algeria and 4.2 to 89.9, 9.4 to 48.7, 1.8 to 3.8 and 12.0 to 87 in Morocco per hundred heads respectively. In the five countries the prevalence is a linear function of the age of the different animal species, and is higher in females than in males. The socio-economic impact of CE is difficult to assess. However, this impact seems be enormous in Libya, Tunisia, Algeria and Morocco. In humans, this impact is linked to the costs of diagnosis and treatment, the loss of income before, during and after treatment, the relapse and new surgical operations in 4 to 10% of cases, and the mortality in 1 to 2% of cases. These losses were estimated at 5 450 000 € in Tunisia and 2 990 000 € in Morocco. In animals, infestation leads to decreases in production of milk (10%), meat (5-20%) and wool (10-40%). It leads also to seizures of infested organs and their destruction. These losses were estimated at 8 550 000 € in Tunisia and at 9 377 700 € in Morocco. Finally, the endemicity of CE in the North African countries is linked to the presence of a number risk factors, the main ones</p>										

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## **XXVII WORLD CONGRESS OF ECHINOCOCCOSIS**

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**ALGIERS, ALGERIA**

being common to all the of five countries. These are (1) the importance of the population of stray dogs and dogs with an owner who live on day parole and are not treated, (2) the importance of the sources of Infestation for dogs (86 420 000 heads of ruminants with a very high prevalence), (3) the relative importance of dog population ( $\approx$  5 871 000 heads), (4) the practice of a traditional breeding system with 1 to 3 dogs per herd, (5) the access of dogs to carcasses of dead animals, wastes from clandestine, family, religious evens slaughtering, (6) poorly equipped slaughterhouses allowing dog access to seizures, (7) ignorance of the infestation mechanism, including the role of the dog, (8) insufficient general hygiene (washing of hands, vegetables, fruit etc.), (9) insufficient control measures of CE, (10) importance of cattle as source of parasites; a peculiarity of the region. However, EC is a preventable disease and, fortunately, over the past 20 years, immunology and molecular biology have allowed significant progress in (1) development of safe, fast and accurate diagnosis of *E. granulosus* infection in definitive host (copro-antigen and copro-DNA), (2) characterization of the parasite, (3) improvement of epidemiological investigations and, (4) possible application of vaccine in ruminants (EG95) to reduce substantially the rate of transmission to these animals and, consequently, to humans. This scientific progress, together with effective health education programmes, will likely improve control programmes and reduce the time required to achieve significant decrease in prevalence or eradication.

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ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par4		Video		Poster	
Title	Knowledge, Attitudes and Practices towards <i>Echinococcus granulosus</i> transmission among Tunisian population									
Authors	BENABID MERIEM, <u>BOURATBINE AÏDA</u> , NOUIRA RAMZI, BELLALI HEDIA, GALAI YOSR, CHAHED MED KOUNI, DZIRI CHADLI, AOUN KARIM									
Affiliation	Laboratoire de Parasitologie médicale, Biotechnologies et Biomolécules-LR 11 IPT 06, Institut Pasteur de Tunis, Tunisie. <a href="mailto:aida.bouratbine@pasteur.rns.tn">aida.bouratbine@pasteur.rns.tn</a>									
ABSTRACT O_Par4_1										
<p><b>Background and Aim:</b> Hydatidosis is a major health threat in Tunisia. The surgical incidence rate is about 13/100000 inhabitants and reaches more than 25/100000 inhabitants in some highly endemic districts. This hyper-endemicity is related to several reasons including high number of stray dogs, widespread practice of sheep rearing and frequent uncontrolled slaughter of sheep. Low knowledge and negative human behavior towards dogs and infected viscera may also explain this epidemiological situation of the disease.</p> <p><b>Methods:</b> Two hundred and sixty six individuals (76 patients, 90 healthy inhabitants of rural zones and 100 less exposed individuals living in cities) were interviewed in order to evaluate their knowledge, attitudes and practices about hydatidosis transmission and control. A questionnaire was completed for each participant. The statistical analysis of the results was carried out using the <math>\chi^2</math> square.</p> <p><b>Results:</b> Knowledge of the parasite transmission was weak despite a high perception of the risk of the disease. Indeed, only 25.8% of the respondents incriminated the dog whereas about 40% of them associated human contamination to infected viscera consumption. The practice of uncontrolled slaughter was frequently reported in rural areas (89.3% of the respondents). Moreover, the attitude towards infected viscera was also inappropriate with 78.5% of the subjects reporting the discovery of infected viscera leaving them easily accessible to dogs.</p> <p><b>Conclusion:</b> Health education on hydatidosis remains insufficient in spite of the high burden and economic losses associated with the zoonosis. It should be reinforced by disseminating the effective messages and using the adapted educational tools. Knowledge, awareness, concern and behavior changing should be promoted mainly in rural and exposed population.</p>										

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ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par4		Video		Poster	
Title	Haplotypic diversity within <i>Echinococcus granulosus sensu stricto</i> in sheep and cattle from steppe regions of Djelfa, Algeria.									
Authors	LAATAMNA ABDELKARIM, EBI DENNIS, BRAHIMI KHADIDJA, BEDDIAF KHADIDJA, WASSERMANN MARION, SOUTTOU KARIM, ROMIG THOMAS									
Affiliation	Faculty of Natural Sciences and Life, University Ziane Achour-Djelfa, Moudjbara, BP 3117, Djelfa, Algeria. <a href="mailto:laatamnaabdelkarim@yahoo.com">laatamnaabdelkarim@yahoo.com</a>									
ABSTRACT O_Par4_2										
<p><b>Background and Aim:</b> Cystic Echinococcosis (CE) is considered as an important helminthic disease caused by the development of metacestodes of <i>E. granulosus sensu lato</i> mainly in the liver and lung of intermediate hosts including humans, livestock and animals in wildlife. This worldwide distributed zoonosis causes serious health problems and considerable economic losses. In Algeria, CE in intermediate hosts (human and livestock) has been reported in endemic epidemiological situations, where the most of studies have been focused on the prevalence and implication of some risk factors on the variation of infestation rate. In Algeria few molecular data is available on the distribution of the different genotypes of the species-complex <i>E. granulosus sensu lato</i> in these intermediate hosts. Therefore, there is a need to get to a better understanding on the molecular epidemiology of CE in livestock of this region.</p> <p><b>Methods:</b> For this, a molecular investigation was carried out to characterize the genotypes of 144 hydatid cysts obtained from 56 sheep's and 37 cattle's in steppe region of Djelfa and demonstrate a possible genetic diversity within these isolates. DNA was extracted from ethanol fixed protoscolices or germinal layer membrane using the NaOH-lysing method described by Nakao et al., 2003. A nested PCR was performed to amplify a fragment of 1609 bp of Cox1 gene. Purified products were sequenced and obtained sequences were analysed using GENTle software (© Magnus Manske) and a maximum parsimony network analysis was performed using TCSv1.21 software (Clemet et al., 2000) to highlight haplotypic variation of sequence isolates.</p> <p><b>Results:</b> Overall, a prevalence of CE was observed on 56 (5.74 %), 37(13.90 %), 0 (00 %) of 975, 266, 37, slaughtered sheep's and cattle's and goats respectively. Out of 56 infested sheep's, 35.71 % (n=20), 28.57 % (n=16) and 35.71 % (n=20) showed a liver, lung and mixed infestation respectively. In infested cattle's, 35.13 % (n= 13), 45.94 % (n=17) and 18.91 % (n=7) of observed cysts were isolated in liver, lung and both organs respectively. Molecular analysis indicated that all isolates belonged to <i>E. granulosus sensu stricto</i> (G1 and G3). In total, 73 haplotypes were revealed including 61 novel haplotypes. The Network showed high haplotypic diversity within isolates of G1 and G3 of sheep and cattle from Djelfa region in Algeria.</p> <p><b>Conclusion:</b> These results confirm the worldwide distribution of <i>E. granulosus s.s</i> and the large genetic variation existing within this species.</p>										

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ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par4		Video		Poster	
Title	Thirty years of research on animal echinococcosis and hydatidosis in Tunisia									
Authors	JEMLI MOHAMED HABIB(1), BOULAJFENE HENDA(2), BENGOUNI MOHAMMED(2)									
Affiliation	(1) Department of Parasitology– National School of Veterinary Medicine – Sidi Thabet – Tunisia (2) FAO Sub regional Office for North Africa <a href="mailto:Henda.Boulajfene@fao.org">Henda.Boulajfene@fao.org</a>									
ABSTRACT O_Par4_3										
<p><b>Background and Aim:</b> Hydatid echinococcosis is a serious parasitic zoonosis in Tunisia, causing major losses for the public health and the country's economy. Prevalence of the asymptomatic hydatid cyst varies from 0.5% to 5% in humans, while the average annual surgical incidence reaches 15 cases per 100000 inhabitants.</p> <p><b>Methods and Results:</b> In animals, the imaginal parasitosis is registered in 25% of dogs, and cysts were found in:</p> <ul style="list-style-type: none"><li>- 10% of 1-year-old sheep and 98% of adult sheep (&gt; 5 years old)</li><li>- 10 to 50% of cattle and 10 to 30% of goats and dromedaries</li></ul> <p>Since the first work initiated by Kilani in the 1980s, the research teams in Tunisia have been focusing, during thirty years, on studying this disease on different levels:</p> <ul style="list-style-type: none"><li>- Epidemiology (autopsy of dogs and research of cysts in slaughterhouses),</li><li>- Treatment of animals,</li><li>- Means of screening and testing of vaccines.</li></ul> <p>This work culminated by the deposit of two patents: the immune stimulatory and protective role of recombinant polypeptides derived from the EgA31 protein of <i>E. granulosus</i> and a <i>per os</i> candidate vaccine strain.</p> <p><b>Conclusion:</b> However, despite the cost and the severity of this disease and the willingness to initiate a control program for this zoonosis, multiple obstacles are still delaying this type of intervention. A control program against echinococcosis, initiated by the FAO, is necessary to limit the damage caused by this disease in North Africa, known to be one of the first endemic regions in the world.</p>										

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FREE COMMUNICATIONS		Oral	<input checked="" type="checkbox"/> Session	Par4	<input type="checkbox"/> Video	<input type="checkbox"/> Poster	<input type="checkbox"/>
<b>Title</b>	<b>Targeting abattoirs to control cystic echinococcosis in Algeria</b>						
<b>Authors</b>	MOHAMED CHERIF BENCHIKH ELFEGOUN, K. KOHIL, B. BABELHADJ						
<b>Affiliation</b>	Institut des Sciences Vétérinaires, Université 1, 25000 Constantine, Algeria. <a href="mailto:blmc25@yahoo.fr">blmc25@yahoo.fr</a>						
<b>ABSTRACT O_Par4_4</b>							
<p><b>Background and Aim:</b> Cystic echinococcosis (CE) is an important anthroponotic parasitic common in Algeria. The predominant life cycle of <i>E. granulosus</i> is a synanthropic cycle with domestic dogs as definitive hosts and livestock animals as intermediate hosts. Slaughter activity represents a potential source for dogs to access infected offal. The aim of the present study was to determine if the contact between dogs and potentially infected offal was possible in licensed abattoirs.</p> <p><b>Methods:</b> Eighty-one private and public abattoirs located in eastern Algeria were assessed with respect to their level of protection against the intrusion of dogs.</p> <p><b>Results:</b> We have demonstrated that in 42 % of these abattoirs, dogs could easily come in contact with potentially parasitized offal. The most common incorrect practices were the dumping of offal freely into the environment, the feeding of dogs with offal, and the leaving of unattended offal in an unsealed chamber. Overall, some hazardous practices remained common customs of workers, and enough abattoirs remain non-compliant so that the cattle-dog domestic cycle of CE is unlikely to be broken.</p> <p><b>Conclusion:</b> Hence, some recommended measures to interrupt parasite transmission include the followings: recognition of the importance of abattoirs in the maintenance of canine echinococcosis, the controlled and proper disposal of offal, the abolishment of the custom of feeding dogs with infected offal and improvements in the level of health education of abattoir staff.</p>							

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ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par4		Video		Poster	
Title	South American Initiative for the surveillance, diagnosis and control of Cystic Echinococcosis									
Authors	PAVLETIC CARLOS F, LARRIEU EDMUNDO, <u>GAVIDIA CESAR M</u> , GUARNERA EDUARDO A, CASAS NATALIA, IRABEDRA PILAR, FERREIRA CIRO, SAYES JULIO, CALDAS EDUARDO, ZINI LISE MICHAEL L, MAXWELL MELODY, AREZO MARCOS, NAVARRO ANA M, VIGILATO MARCO A, COSIVI OTTORINO, ESPINAL MARCOS, DEL RIO VILAS VICTOR J.									
Affiliation	National University of San Marcos, Lima, Peru, and South American Initiative <a href="mailto:cmgavidia@yahoo.com">cmgavidia@yahoo.com</a>									
ABSTRACT O_Par4_5										
<p><b>Background and Aim:</b> Cystic echinococcosis (CE) or hydatidosis, a parasitic zoonosis caused by a cestode of the family Taeniidae, species <i>Echinococcus granulosus</i>, is endemic in several countries. In South America, the disease is prevalent in Argentina, Chile, Peru, Uruguay and southern Brazil. During the Meeting of the Ministers of Agriculture and Health of Americas (RIMS 12) in 2001, Argentina, Brazil, Chile and Uruguay requested to PAHO the constitution of the Sub-Regional Project for the Surveillance and Control of CE; this was finally established in 2004. In 2013, Peru joined the Project to constitute what is now known as the South American Initiative for the surveillance, diagnosis and control of CE. Our aim is to describe the organization and operation of the initiative.</p> <p><b>Methods:</b> Since 2004 there has been a total of twelve Meetings of the Initiative, the last one in 2016 was held in Brazil, when Paraguay joined the Initiative. The Initiative main objective is to stimulate the governance, formulation of strategies and action plans, for the control and elimination of CE as a public health problem in the region. The Initiative delivered on a number of fronts: i) two online courses for CE control programs; ii) facilitated lab trainings, iii) a guide on surveillance and control to standardize approaches; iv) the proficiency testing exercise among reference laboratories; v) the first national evaluation held in Uruguay. Recently the Initiative has collected data on CE incidence/occurrence and some program indicators to inform a first regional baseline for humans and animals cases.</p> <p><b>Results:</b> We present information for the five countries from 2009 to 2014, and indicators of the performance of their national control programmes. Paraguay was not included in this analysis because it s recently joined in 2016.Nearly 5,000 new CE cases were diagnosed each year in the five countries. The average case fatality rate was 2.9%, which suggests that CE led to approximately 880 deaths in the region during the six-year period. CE cases that required secondary or tertiary health care spent, on average, 10.6 days in hospital leading to a significant burden on the countries’ health systems. Additionally, the proportion of new cases (15%) in children &lt;15 years old suggests ongoing transmission.</p> <p><b>Conclusion:</b> Despite these figures that show that CE is not under control in the region, the long-standing implementation of national and local control programmes in three of the five countries has achieved reductions in some of the above indicators. The Regional Initiative for the Control of CE, which includes the 6 countries and contributes to institution networking must intensify its efforts for controlling CE in the region.</p>										

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ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par4		Video		Poster	
Title	Evaluation of Western Blot method with cystic echinococcosis patients who were found negative by IHA and ELISA									
Authors	AYGUL SADIQOVA, EYLEM AKDUR OZTURK, AHMET OZKEKLIKCI, MESUT AKIL, SELDA KARAMIL, NURAY ALTINTAS, AYSEGUL UNVER, NAZMIYE ALTINTAS									
Affiliation	Ege University, Faculty of Medicine, Department of Parasitology, Izmir, TURKEY <a href="mailto:nazaltintas1@gmail.com">nazaltintas1@gmail.com</a>									
ABSTRACT O_Par4_6										
<p><b>Background and Aim:</b> The diagnosis of chronic cystic echinococcosis (CE) is often difficult because of its asymptomatic character and relies on imaging the cysts along with serological testing as secondary confirmatory tests. The lack of highly specific and sensitive immunodiagnostic tests lead to false negative and false positive results in different laboratories. Reasons for false negative results depend on several factors comprising cyst location, early (CL and CE1) and inactive (CE4 and CE5) cyst stages, serum collection before treatment, single and small cysts, and hydatid fluid (HF) antigenic source variability. The above conditions may limit the expression of hydatid circulating antigen to blood circulation and cause false negative results in the serological diagnosis. The aim of this present study was to assess the diagnostic value of WB in the false negative results using the patients with known cyst stage and seronegative IHA and ELISA results.</p> <p><b>Methods:</b> 104 patient sera previously screened for the presence of <i>E.granulosus</i> IgG antibodies using in-house ELISA and the commercial IHA kit (IHA-Fumouze kit) included in the study were hospitalized in Dr. Ersin Arslan Hospital in Gaziantep, Turkey between 2014 &amp; 2016. WB test was performed with these sera and sheep hydatid fluid (HF) used as an antigen source.</p> <p><b>Results:</b> Out of 100 patients, 64% were female and 33% were male patients. They were between 19 and 70 years of age (average age is <math>\pm 51.02</math>). Lesions distribution of organ involvement in suspected patients is; liver 96.26%, spleen 3.23%, multiple organ involvement 0,1% and other organ involvement 0.5 %. Cyst stage of these patients is CL- 65%, CE 1- 5%, CE2 - 18%, CE3- 5%, CE4- 4%, CE5- 2%. Hydatid fluid of sheep was resolute by SDS-PAGE under reducing conditions and the protein bands of different patients with known cyst stages but had negative IHA and ELISA results were exposed through WB assay. According to the statistical results of WB bands as follow; 36-38 kDa bands in 65 cases (65%) a , 60-75 kDa band in 44 cases ( 44 % ) , 45-50-55 kDa in 24 cases (24%), 34 kDa band in 11 cases (11%), 22-24-26 kDa in 10 cases (10%), 110 kDa band in 9 cases (9%), 20-22kDa bands in 8 cases (8%), 12 kDa band in 5 cases (5%), 8 kDa band in 1 case (1%).</p> <p><b>Conclusion:</b> In our study, most patients were at CL stage (65 %) and CE4 and CE5 stages were 6 %. Reports in the literature describe negative results could be due to the wall thickness of the individual <i>E. granulosus</i> cystic lesions. Calcified cysts with thick cyst walls also significantly compromise the probability of reliable immunological diagnostics. By these reasons, the IHA and ELISA tests may have shown seronegativity. WB as a sensitive test may help us at this moment. We believe that it should be safer to use at least two serological tests together and need to confirm by WB for false negative diagnosis of CE.</p>										

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ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par5_1		Video		Poster	
Title	Recent efforts to improve the diagnosis of canine echinococcosis in South America and future directions									
Authors	<sup>1</sup> NOELIA MOREL, <sup>1</sup> SUSANA ELOLA, <sup>1</sup> CIRO FERREIRA, <sup>2</sup> <u>GUALBERTO GONZALEZ-SAPIENZA</u>									
Affiliation	<sup>1</sup> Comision Nacional de Zoonosis, MSP. <sup>2</sup> Cátedra de Inmunología, Facultad de Química, UDELAR, Uruguay <a href="mailto:cferreira@msp.gub.uy">cferreira@msp.gub.uy</a> <a href="mailto:ggonzal@fq.edu.uy">ggonzal@fq.edu.uy</a>									
ABSTRACT I_Par5_1										
<p>The detection of <i>E. granulosus</i> antigens in dog feces has proven to be the most sensitive and cost-effective method for the diagnosis of parasite infections in dogs. However, the lack of commercial or house-made tests has been a major obstacle for its use in most control programs in our region. Owing to the availability of reagents, PCR has been considered as an alternative method. However, a recent collaborative effort in our region evidenced the limitations of the technique in terms of costs, number of samples that can be processed, and the need of standardization and validation.</p> <p>In the past years, the national Control Program in Uruguay has been using a locally developed copro-ELISA to analyze thousands of samples, and more recently, some samples have also been tested in parallel by PCR.</p> <p>The accumulated experience showed that in a setting where the dogs are regularly dewormed and tested during the pre-patent period, the sensitivity and high processing capacity of antigen-detecting assays are needed.</p> <p>The development, validation, efforts to adapt the assay as a point of care test and its eventual availability to other users will be discussed.</p>										

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ALGIERS, ALGERIA

FREE COMMUNICATIONS	Oral	<input checked="" type="checkbox"/> Session	Par5	<input type="checkbox"/> Video	<input type="checkbox"/> Poster
Title	Development and evaluation of an immunodiagnostic test for Cystic Echinococcosis in intermediate hosts				
Authors	SERAFINO JUAN; GALLO CALDERÓN MARINA B; JENSEN OSCAR; LARRIEU EDMUNDO, HEATH DAVID, <b>POGGIO T VERÓNICA</b> .				
Affiliation	Centro de Virología Animal – CEVAN-Instituto de Ciencia y Tecnología “Cesar Milstein” (CONICET). Saladillo 2468, C1440FFX. Bs As, Argentina. <a href="mailto:ypoggiocevan@centromilstein.org.ar">ypoggiocevan@centromilstein.org.ar</a>				
ABSTRACT O_Par5_1					
<p><b>Background and Aim:</b> Cystic Echinococcosis (CE) is one of the most prevalent zoonosis in Argentina. There is not availability of serological diagnostic tools for detection of antibodies against <i>Echinococcus granulosus</i> antigens in sheep and goats to support the epidemiological monitoring and surveillance over time. Analysis of the <i>E granulosus</i> genome shows that the 8-kDa glycoprotein family from taeniid cestodes comprises widely distributed members with high molecular diversity either for cross- reaction or specific reaction among metacestodes. For these reason, some variants of the 8-kDa protein can be used for the specific diagnosis of metacestode infections. Our aim was to develop and validate a new diagnostic technology for detection of <i>E. granulosus</i> antibodies in serum of sheep and goat by an immunoenzymatic assay.</p> <p><b>Methods:</b> Gene coding for 8-kDa protein of <i>E. granulosus</i> was amplified by the polymerase chain reaction and cloned into pGEX-1 lambda T vector. Nucleotide sequence analysis was performed. The recombinant 8-kDa protein was expressed as inclusion bodies, purified by affinity chromatography and immunologically characterized by Western blot. Pool of sera from experimentally or naturally infected sheep from endemic zone, and non-vaccinated animals living in a hydatid free area, which revealed no cysts and non-reactive Western blot, were involved into the direct ELISA standardization. All reagents, plate design, dilution of sera and controls, the determination of the cut off and the acceptance and rejection criteria were performed according to requirements from OIE Manual of diagnostic tests.</p> <p><b>Results:</b> The recombinant 8 kDa protein (90 aminoacids) was expressed in bacteria according to the expected size and the immunological characterization after purification was achieved by monoclonal antibodies anti-Glutathione S-transferase (GST) and anti Histidine (6XHis). The recombinant antigen was captured to the plate at optimal coating concentration, and secondary antibody worked optimally at suggested dilutions. No evidence of cross reactivity with other related parasitic infections was detected. These results minimized the risk of obtaining false positive immune response. Sensitivity, specificity, and positive or negative predictive values above to 90% have been estimated comparing our ELISA test with Western Blot. To date, this technology is being submitted to a specific set of essential validation criteria from OIE for infectious disease.</p> <p><b>Conclusions:</b> There is an urgent need for specific, inexpensive, rapid and highly sensitive screening diagnostic tests that can be used for epidemiological studies, control programs, surveillance and identification of CE infected intermediate hosts. Progress has being made in development of a novel immunodiagnostic kit using the recombinant 8kDa- protein of <i>E. granulosus</i> as antigen capture</p>					

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## **XXVII WORLD CONGRESS OF ECHINOCOCCOSIS**

**4<sup>th</sup> – 7<sup>th</sup> OCTOBER, 2017**

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ELISA method. This technology including a well-characterized recombinant antigen has been successfully standardized and tested with a promising specificity, sensitivity and positive/negative predictive values as an accurate diagnostic tool.

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ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par5		Video		Poster	
Title	Helminths of the wild boars ( <i>Sus scrofa</i> ) population in Tunisia.									
Authors	LAHMAR SAMIA <sup>1</sup> , M'HEMMED HANA <sup>1</sup> , MHADHBI NÉJIB <sup>1</sup> , TIZAOUI LAMIA <sup>1</sup> , DRISS HANA <sup>1</sup> , BANI ABDELKADER <sup>1</sup> , MAKHZOUMI MANEL <sup>1</sup> , GHRISSI NEBIHA <sup>1</sup> , BEN HOUIDI AMEL <sup>1</sup> , DHIBI MOKHTAR <sup>1</sup> , BOUFANA BELGEES <sup>2</sup>									
Affiliation	1Parasitology Laboratory, National School of Veterinary Medicine, 2020 Sidi Thabet, Tunisia. 2Department of Infectious, Parasitic and Immunomediated Diseases, Istituto Superiore di Sanità (ISS), Rome, Italy. <a href="mailto:drlsamia@yahoo.fr">drlsamia@yahoo.fr</a>									
ABSTRACT O_Par5_2										
<p><b>Background and Aim:</b> No information is available on the parasite situation of wild boars in Tunisia. The objectives of this survey were therefore to describe the gastrointestinal, pulmonary, hepatic helminth species and <i>Trichinella</i> spp. larvae of wild boars and to evaluate the role of this animal in the epidemiology of helminthiasis of other animal species and humans.</p> <p><b>Methods:</b> During the hunting periods (2008-2013), 264 wild boars were shot in the northeast and the northwest areas of Tunisia. At necropsy, esophagi, stomachs and intestines of each animal were removed, separated then opened to detect any gastrointestinal helminths present. Also, 232 faecal samples were collected directly from the rectum of each animal and examined for parasite eggs and larvae by qualitative flotation method. Individual samples of 297 lungs and livers from other necropsied wild boars were examined for <i>Echinococcus granulosus</i> larvae, lungworms and <i>Taenia hydatigena</i> larvae. Hydatid cysts were identified by gross examination and palpation of the lungs and livers. Livers were then cut into thin slices to detect and count all <i>E.granulosus</i> larvae. Fertility rate and viability of protoscoleces were determined for each fertile cyst per animal and organ. Twelve hepatic and pulmonary viable hydatid cysts were used for genotypic molecular analysis. The trachea, large bronchi and bronchioles were opened to collect Metastrongylids. To detect <i>Trichinella</i> spp. infection, 150 muscular samples were examined by Trichinoscopy and by artificial digestion.</p> <p><b>Results:</b> An overall prevalence of 80.30% was found for gastrointestinal helminth infections with a mean intensity of 59.29 worms/infected boar. The global prevalence of infection with <i>Metastrongylus</i> spp. was of 60.26% with a mean intensity of 107.37 worms/infected animal. Cystic Echinococcosis infection rate reached 18.85% with 4.42 <i>Echinococcus granulosus</i> larvae per wild boar. <i>E.granulosus</i> sensu stricto (s.s.) was identified from all analyzed hydatid cysts. A total of 4.04% of wild boars harboured <i>Taenia hydatigena</i> metacestode. Coproscopy revealed <i>Strongyloides ransonii</i> and <i>Capillaria</i> spp. species. This study detected fourteen helminth species: <i>Macracanthorhynchus hirudinaceus</i> (61.74%), <i>Metastrongylus apri</i> (60.26%), <i>Metastrongylus pudendotectus</i> (60.26%), <i>Ascarops strongylina</i> (54.92%), <i>Globocephalus urosubulatus</i> (26.51%), <i>Gongylonema pulchrum</i> (21.59%), <i>Brachylaemus suis</i> (21.21%), <i>Echinococcus granulosus</i> larvae (18.85%), <i>Cysticercus tenuicollis</i> (4.04%), <i>Physocephalus sexalatus</i> (3.40%), <i>Hymenolepis diminuta</i> (0.37%), <i>Gnathostoma hispidum</i> (0.37%), <i>Strongyloides ransonii</i>, <i>Capillaria</i> spp. No <i>Trichinella</i> sp. larvae was found.</p>										

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**Conclusion:** Wild boars are infected with a large spectrum of helminths. They can play a significant role in the circulation and maintenance of certain parasites transmitted to livestock and humans, mainly *Echinococcus granulosus*. Because some of wild animals inhabit areas near the suburbs, a potential sylvatic cystic echinococcosis cycle involving wild boars and wild canids should be present in Tunisia.

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4<sup>TH</sup> – 7<sup>TH</sup> OCTOBER, 2017

ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par5		Video		Poster	
Title	Genotyping Echinococcus granulosus isolated from stray dogs and golden jackals in Ilam Province southwest of Iran									
Authors	ABDOLHOSSEIN DALIMI, MORTEZA SHAMSI									
Affiliation	Department of Parasitology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran <a href="mailto:dalimi_a@modares.ac.ir">dalimi_a@modares.ac.ir</a>									
ABSTRACT O_Par5_3										
<p><b>Background and Aim:</b> The aim of the present study was to identify genotype of adult stage of <i>E. granulosus</i> isolated from stray dogs and golden jackals in Ilam province southwest of Iran.</p> <p><b>Methods:</b> A total of 140 dead stray dogs and golden jackals was collected from roads of different area of Ilam province during 2014-2016. Twenty dogs and two jackals were found to be infected with <i>E. granulosus</i>. After DNA extraction of the worms, the <i>Cox1</i> gene of mitDNA was amplified by PCR. The fragments of 450bp were obtained from amplification for all isolates. Then the fragment was cut by <i>AluI</i> and <i>HpaII</i> and <i>RsaI</i> restriction enzymes. In order to confirm the RFLP results, a number of PCR products were bi-directionally sequenced.</p> <p><b>Results:</b> Based on the DNA sequencing and PCR-RFLP, the result indicated that, the genotypes of the adult stage of <i>E. granulosus</i> are similar in both definitive hosts. According to the phylogenetic tree, the overall isolates sequences indicated 100% homology with reference G1, G2 and G3 sequences in the GenBank database.</p> <p><b>Conclusion:</b> In fact, G1 genotype (sheep strain) is the dominant genotype of human and livestock in Ilam province, which is the same as what has been previously reported in Iran.</p>										

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4<sup>th</sup> – 7<sup>th</sup> OCTOBER, 2017

ALGIERS, ALGERIA

FREE COMMUNICATIONS		InvOral	X	Session	Par5		Video		Poster	
Title	Vaccination against cystic echinococcosis – where are we?									
Authors	MARSHALL W. LIGHTOWLERS									
Affiliation	The University of Melbourne, Veterinary Clinical Centre, 250 Princes Highway, Werribee, Victoria 3030 AUSTRALIA <a href="mailto:marshall@unimelb.edu.au">marshall@unimelb.edu.au</a>									
ABSTRACT I_Par5_2										
<p>Control options for hydatid disease have been modelled mathematically and the results indicate that an effective strategy would be the application of the EG95 vaccine in livestock together with 6-monthly treatment of dogs with anthelmintic. Field application of the EG95 vaccine is currently underway in regions of Argentina, Chile and China and evaluations of the vaccine are underway in Morocco and Peru.</p> <p>Attention is being focussed on developing strategies to encourage use of the vaccine in livestock in endemic regions. A potential strategy may be to combine the EG95 antigen with vaccines for the prevention of other diseases. Two strategies are being investigated. Firstly, a pathogen which occurs commonly in regions where <i>E. granulosus</i> occurs is <i>Taenia multiceps</i>. Protective oncosphere antigens of <i>T. multiceps</i> have been produced as recombinant proteins and these have been shown to be able to protect sheep against death following challenge infection with <i>T. multiceps</i>. A second approach that is being assessed is through the combination of EG95 with the commonly used commercial vaccines against sheep clostridial diseases. Various formulations of EG95 plus a commercial <i>Clostridium perfringens</i> vaccine have been tested. One combination has been identified which passed <i>in vivo</i> quality control and efficacy criteria for both the clostridial component as well as the EG95 component. Vaccination trials in sheep have demonstrated that this combined vaccine is safe and efficacious. Consideration is being given to undertaking field trials of the clostridial/hydatid combination vaccine in an endemic region of Turkey.</p> <p>To date, vaccine trials with EG95 have involved <i>E. granulosus sensu stricto</i> ('strains' G1-3), which is responsible for causing approximately 90% of all genotyped cases of CE in humans. Most of the remaining cases of human CE infections are caused by <i>E. canadensis</i>. The EG95 gene family from <i>E. canadensis</i> ('strain' G6) have been cloned and sequenced, revealing significant differences in the predicted amino sequence of the EG95 homologue in <i>E. canadensis</i> in comparison to EG95 from <i>E. granulosus sensu stricto</i>. It has yet to be determined whether the current EG95 vaccine would protect intermediate hosts against a challenge infection with <i>E. canadensis</i>, or whether the protein expressed by the homologous gene in <i>E. canadensis</i> would be protective.</p>										

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4<sup>th</sup> – 7<sup>th</sup> OCTOBER, 2017

ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par5		Video		Poster	
Title	Evaluation of new strategy for vaccination against cystic echinococcosis using various isoforms of EG95									
Authors	MAJID PIRESTANI; <u>ABDOLHOSSEIN DALIMI</u>									
Affiliation	Department of Medical Parasitology and Entomology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran <a href="mailto:pirestani@modares.ac.ir">pirestani@modares.ac.ir</a> <a href="mailto:dalimi_a@modares.ac.ir">dalimi_a@modares.ac.ir</a>									
ABSTRACT O_Par5_4										
<p><b>Background and Aim:</b> Cystic Echinococcosis (CE) is caused by the larval stage of <i>Echinococcus granulosus</i>. throughout the world. Vaccination of livestock may provide an additional approach to the control of echinococcosis. The present study aimed to evaluate a new vaccination strategy against cystic echinococcosis using various isoform of EG95 in a murine model.</p> <p><b>Methods:</b> RNA was extracted from oncospheres and protoscoleces then amplified by PCR and RT-PCR with specific primers of EG95. RT-PCR products were ligated into pJET1.2 cloning vector. For Eg95 expression, Eg95 fragment sub cloned into pET32-a+ plasmid. The purification was performed in the presence of 8M urea by Ni–NTA column and dialysis. The purified recombinant proteins were confirmed by Western blot analysis using polyclonal antiserum. To find out the immunogenicity of the purified protein, the BALB/c mice were immunized by injecting 20 µg rEG95 protein formulated in alum adjuvant. Five groups of female mice were immunized subcutaneously with recombinant Eg95 (10 mice/group). EG95-1 and EG95-5 construct were used for priming and boost in combination and respectively. Then, all mice were challenged with <i>Echinococcus granolusus</i> protoscoleces (PSCs) intraperitoneally. Finally, the humoral immune and the cellular immune responses were evaluated.</p> <p><b>Results:</b> Mice immunized with EG95-1 for priming and EG95-5 for boosting produced effective immunity protection (reductions in cyst load more than 96.9%). Specific IgG, IgG1 and IgG2a responses were accompanied by IFN-γ production. Nevertheless, the level of IL-4 and IL-10 increased in the EG95-5 priming group and in the control group compared to the EG95-1 priming group.</p> <p><b>Conclusion:</b> Our findings suggest a new strategy for vaccination that can elicit a strong cellular and humoral response against cystic echinococcosis/hydatidosis in the murine model.</p>										

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ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par5		Video		Poster	
Title	Pilot field trial of the EG95 vaccine against ovine cystic echinococcosis in Rio Negro, Argentina: 7 years of work									
Authors	LARRIEU EDMUNDO, AREZO MARCOS, MUJICA GUILLERMO, HERRERO EDUARDO VIZCAYCHIPI KATHERINA, LABANCHI JOSE LUIS, ARAYA DANIEL, GRIZMADO CLAUDIA, CALABRO ARNOLDO, TALMON GABRIEL, SEPULVEDA LUIS, GALVAN JOSE MARIA, SANTILLÁN GRACIELA, SELEIMAN MARCOS, CROWLEY PABLO, CESPEDES GRACIELA, GARCÍA CACHAU MARIELA, GINO LILIA, MOLINA LEONARDO, DONADEU MERITXELL, LIGHTOWLERS MARSHALL L									
Affiliation	Universidad Nacional de La Pampa, Universidad Nacional de Rio Negro, & Ministerio de Salud de Rio Negro, Argentina ; University of Melbourne, Australia. <a href="mailto:ejlarrieu@hotmail.com">ejlarrieu@hotmail.com</a>									
ABSTRACT O_Par5_5										
<p><b>Background and Aim:</b> Cystic echinococcosis is endemic in the Rio Negro province of Argentina. After 30 years of control using praziquantel in dogs the transmission rate to humans and sheep has decreased significantly, however transmission persists. The objective of the study is to assess the impact of the inclusion of the EG95 vaccine for sheep in the control program, including analysis of the vaccine’s operative feasibility in field conditions.</p> <p><b>Methods:</b> An intervention study with a control group was defined. Each farm was defined as an Epidemiologic Unit (EU), each containing one house or houses for one extended family. The regions chosen for the program were Anecon Grande, Rio Chico Abajo, Nahuel Pan (vaccination area with 79 EU) and Manuel Choique, Blancura Centro and Lipetren (control area within vaccination with 71 EU). The geographic region was the Rio Negro Province in Argentina comprising, in total, an area of 5820 Km2. Lambs received two vaccinations with the EG95 vaccine followed by a single booster injection when the animals were 1-1.5 years of age. Vaccination of lambs born into one trial site was introduced and continued for 7 years. Evidence for <i>Echinococcus granulosus</i> transmission was monitored by coproantigen ELISA on samples of dog faeces, purgation of dogs to detect <i>E. granulosus</i> worms, anti-<i>E. granulosus</i> antibody assessments in sera from 2-4 tooth lambs, necropsy on adult sheep and register of new cases symptomatic or identify by ultrasound screening in children of 6 to 14 years old.</p> <p><b>Results:</b> Before the vaccine was introduced, in vaccination area, 26.2% of sheep with 2-4 teeth were positive using ELISA/WB. Necropsy of animals older than 6 years showed that 56.3% of animals were infected with <i>E. granulosus</i>. In dogs, 4% was found positive for <i>E. granulosus</i> using arecoline purgation and 24.7% of the farms were infected using coproELISA/WB. Between 1999/2015 34 new cases (12 of 1 to 10 years old) were diagnosed in the work area. A total of 21,447 doses of EG95 vaccine were applied in the 2009-2015 period. The prevalence of sheep with 2-4 teeth using ELISA/WB decreased to 7.8% at the third years in vaccination area. At the six years, in old sheep, introduction of the vaccine led to a statistically significant 62% reduction in the prevalence of ovine</p>										

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CE (21.6%) and a reduction in the number (1.5 to 0.3 cystic x animal) and size of hydatid cysts in comparison to the situation prior to the introduction of the vaccine, or compared to CE prevalence in the control area. In 2016 3 new case were diagnoses (only 1 of 1 to 10 years old) and only 6.6% of the sheep farms had a dog positive to arecoline test.

**Conclusion:** The difficulties in the field for the correct vaccine administration and the social features and habits that may impact on echinococcosis control are included in the analysis of the EG95 vaccine in Rio Negro. Vaccination of sheep with the EG95 vaccine provides a valuable new tool which improves the effectiveness of CE control activities. Vaccination was effective even in a difficult, remote environment where only approximately half the lambs born into the communities were fully vaccinated.

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4<sup>th</sup> – 7<sup>th</sup> OCTOBER, 2017

ALGIERS, ALGERIA

FREE COMMUNICATIONS		Oral	X	Session	Par5		Video		Poster	
Title	Immunological features and efficacy of the recombinant subunit vaccine LTB-EMY162 against <i>E.multilocularis</i>									
Authors	LI RUNLE, TANG FENG, YANG QUANYU, FAN HAINING, GE RILI									
Affiliation	Research Center for High Altitude Medicine, Qinghai University, Xining, PR China <a href="mailto:aprilmomoa@163.com">aprilmomoa@163.com</a> <a href="mailto:geriligao@hotmail.com">geriligao@hotmail.com</a>									
ABSTRACT O_Par5_6										
<p><b>Background and Aim:</b> Alveolar Echinococcosis, caused by the larval stage of <i>Echinococcus multilocularis</i> infection, is a zoonotic disease with worldwide distribution especially in the northwest of China. To develop a well-tolerated immunoprophylaxis against <i>E. multilocularis</i> is a highly valuable goal for Alveolar Echinococcosis control.</p> <p><b>Methods:</b> In this study, a prokaryotic expression system for recombinant immunogen LTB-EMY162 was established and the immunological features, sensitized lymphocyte, prophylactic effect and therapeutic effect were also evaluated.</p> <p><b>Results:</b> Through Arctic Express system, Ni<sup>2+</sup>-charged and molecular sieve chromatography, a high purity 29 kDa protein was obtained. Through serum ELISA and lymphocyte proliferation assay we found LTB-EMY162 induced high titer specific IgG for EMY162 and <i>E. multilocularis</i> protoscoleces protein in BALB/c mice and promoted sensitized lymphocyte proliferation, and LTB-EMY162 might induce a Th1/Th2 mixed type immunological response. We also found that LTB-EMY162 significantly prevented protoscoleces growth (Inhibition ratio was 91.10%) in protoscoleces infected immunized mice model. In <i>E. multilocularis</i> infected mice model, the number of vesicles was significantly reduced (Inhibition ratio was 86.60%) and the membrane of protoscoleces were broken by treating with LTB-EMY162.</p> <p><b>Conclusion:</b> In summary, we have designed and constructed a subunit vaccine LTB-EMY162 which has biological functions of prevention and treatment for Alveolar Echinococcosis.</p>										

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