ABSTRACT BOOK

9TH NATIONAL AND 2ND INTERNATIONAL CONGRESS OF HYDATIDOLOGY

Dear distinguished members and colleagues,

On behalf of the organizing committee, we are pleased and honored to welcome you to the 9th NATIONAL AND 2nd INTERNATIONAL CONGRESS OF HYDATIDOLOGY which will be held in Nicosia / NORTH CYPRUS on november 15-17, 2018 by the collaboration of Turkish Association of Hydatidology and Near East University.

Echinococcosis is one of the most important helminthic diseases all over the world on both human and animal health and also inducement of economic loses in many countries. So we strongly believe that our congress involving the recent developments will be very profitable and contribute a lot to the solutions of human and animal health issues for our countries and also will be very instructive and indicative especially for the young researchers. A number of the internationally distinguished speakers with the expertise in the fields are invited.

On the behalf of the organizing committee, I would like to express our happiness to be with you in this scientific and social sharing environment. We are looking forward to meeting you in NORTH CYPRUS in November 2018.
Best regards,

Prof.Dr. Nazmiye Altıntaş
President of Turkish Association of Hydatidology
Vice President of World Association of Echinococcosis

WELCOME

On behalf of the local organising committee, I take great pleasure to wellcome you to the 2.nd International , 9th National Congress of Hydatidology which is organized by joint efforts of Near East University and Turkish Association of Hydatidology. The scientific program will consist of conferences by internationally recognised experts of hydatidology as well as scientists from Turkey and North Cyprus. Free papers and posters have been received from many countries that will cover clinical cases and or basic scientific issues.

We are proud to host this important event here in our University and Congress Center and hope that you will enjoy your visit to sunny North Cyprus and benefit grately from your participation.

Prof.Dr.Hasan Besim

Near East University Faculty of Medicine

Department of General Surgery

President of Local Organising Committee

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(*Rector of Near East University*)

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President of Turkish Association of Hydatidology

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University of Salford – England

THOMAS ROMIG
University of Hohenheim – Germany

INVITED SPEAKERS

Dr.Bernadette Abela-Ridder is team leader for neglected zoonotic diseases in the Department for the Control of Neglected Tropical Diseases of the World Health Organization (WHO), with responsibility for rabies control. With degrees and a PhD in veterinary medicine and Tropical Veterinary Medicine she has worked in clinical practice, carried out research in Cameroon and worked on veterinary drug approval for the Food and Agriculture Organization of the United Nations and the US Food and Drug Administration before joining the WHO. Within WHO, she worked in the Department of Food Safety and Zoonoses, leading a capacity building network, the Global Foodborne Infections Network (GFN) and was the WHO focal point for the FAO, OIE, WHO Global Early Warning System for transboundary animal diseases, including zoonoses (GLEWS).

Prof.Thomas Junghans is a specialist in internal medicine, tropical medicine and infectious diseases, holds a MSc in Public Health in Developing Countries from the University of London and a Diploma in Geosciences. From 1988 to 1997 he worked at the Swiss Tropical and Public Health Institute. He joined Heidelberg University Hospital in 1997 where he heads the Section Clinical Tropical Medicine at the Centre for Infectious Diseases. The Unit coordinates an interdisciplinary special clinic on echinococcosis since 1999. The main research areas of the Unit are Echinococcosis, Buruli Ulcer and Dengue. He is new Chair of the WHO Informal Working Group on Echinococcosis (WHO-IWGE). This working group has been the principal advisory group to WHO for the control and case detection and management of cystic (CE) and alveolar (AE) echinococcosis.

Dr. Carmen-Michaela CRETU is Associate Professor and Chief of Parasitology Department in "C. Davila" University of Medicine and Pharmacy, Bucharest. She is coordinating doctor for French Embassy and French Community in Bucharest. Her research and clinical expertise includes clinical parasitology, tropical medicine and travel medicine and ultrasonography. She is President of the Romanian Association of Hydatidology (founding member), Vice President of the Romanian Society of Parasitology (founding member) and member of Royal Society of Tropical Medicine and Hygiene, European Society of Clinical Microbiology and Infectious Diseases, International Society of Travel Medicine, European Federation of Societies for Ultrasound in Medicine and Biology, International Commission on Trichinelosis, International Association on Hydatidology, steering committee WHO Collaborating Centre for the Prevention and the Treatment of Human Echinococcosis (invited as expert: Pavia, 2003; Besançon, 2007), Balkan Medical Union, South-Eastern and Eastern European Society of Parasitology (SEEEPS) (founding member, Responsable for Clinical Parasitology Group). She involved in some National and International Research Projects and published papers in National and International journals. Dr. Carmen-Michaela CRETU has been Invited speaker to national and international meetings: ie European Conference of Microbiology and Infectious Diseases (Barcelona, 2008; Milan, 2011). She published 9 books in Parasitology and Tropical Medicine.

Cesar M. Gavidia. He is Principal Professor, School of Veterinary Medicine Epidemiology Laboratory Director of the Graduate Office Universidad Nacional Mayor de San Marcos Lima, Peru. He was graduated from Universidad Nacional Mayor de San Marcos, Veterinary Faculty, Lima, Peru. He has been working in Public Health since 1992 when he was doing field epidemiology and was responsible for pig sampling in a Taenia solium/cysticercosis project in the Peruvian Highlands. He decided to advocate his time and effort to work with zoonotic parasites in order to understand their transmission, risk factors, treatment and the development of control strategies. He worked both in the field and in animal models in their Animal Facilities in the Veterinary School. He has had the opportunity to work with other parasites such as Echinococcus granulosus, Cryptosporidium, Cyclospora, and Trypanosoma cruzi. Currently, he has been spending most of his time to investigate in Echinococcus granulosus / Cystic Echinococcosis during the last 15 years; he has published research related to field epidemiology, clinical trials in animals looking for novel treatment strategies, serological diagnosis, and evaluating control strategies

Peter Deplazes is full Professor and Director of the Institute of Parasitology of the Medical and Vetsuisse-Faculty, University of Zurich (Switzerland). He graduated from the University of Zurich in 1984 where he also performed his doctoral thesis. From 1988 to 1990 he was assistant and 1992 he became head of the laboratory for Zoonoses at the Institute of Parasitology, University of Zurich. In 1991, he was a guest scientist at the Institute for Molecular Genetics and Animal Disease, School of Veterinary Studies, Murdoch (Western Australia). His main research focuses on the biology, epidemiology, diagnosis and control of zoonotic parasites, such as Cryptosporidium, Taenia, Echinococcus, and Toxocara, and on opportunistic parasites in immune-deficient patients. He is a founding member of the European Veterinary Parasitology College (EVPC) and of ESCCAP and he is member of several professional organizations as well as several advisory boards of a number of foundations aiming to improve parasitology. He is co-author of more than 200 peer-reviewed papers and was invited speaker at many conferences and symposiums.

Prof. Patrick Giraudoux is an ecologist who has been working on alveolar echinococcosis since the late 80s. His research focuses on wildlife and landscape ecology, and ecosystem health. It aims at understanding how and on which scales, the spatial structure of ecological systems drives the population dynamics of small mammals, their predators, pathogens and toxicant transfers, and their impacts on socio-ecosystems. He has been developing research in ecohealth on the multi-scale analysis of the effects of regional ecosystem disturbance, with implications in agriculture, health (research programs on Echinococcosis in Europe and Asia), conservation and the management of wildlife – human conflicts. He is honorary member of the Institut Universitaire de France, one of the founders of the research lab UMR 6249 CNRS Chrono-environment (https://chrono-environnement.univ-fcomte.fr) in 2008, of the LTER Zone atelier Arc jurassien (http://zaaj.univ-fcomte.fr) in 2013, and he coordinates the CNRS international network "Ecosystem health and environmental disease ecology" (http://gdri-ehede.univ-fcomte.fr) since 2013. He is the foreign director of the "Wildlife Management and Ecosystem Health" research lab he founded at the Yunnan University of Finance and Economics, China, in 2012, and a member of the board of the WHO collaborating centre for the prevention and treatment of human echinococcoses in Besançon, France, since 1995.

Marianna Karamanou is a Dermatologist-Venereologist, Associate Professor of History of Medicine and elected Head of the Laboratory of History of Medicine and Medical Deontology in the Medical School, University of Crete, Greece. She is a research fellow in the Institute of Medical Humanities, Medical School, Lausanne, Switzerland. She is currently President of the Hellenic Department of Balkan Medical Union. Her research work covers the whole spectrum of history of medicine and all time periods with a special research focus on history of medicine of 18th, 19th and 20th century. She has more than 200 publications in international journals and her research has received several national and international distinctions.

Dr. Adriano Casulli, PhD, is the head of the "WHO Collaborating Centre for the Epidemiology, Detection and Control of Cystic and Alveolar Echinococcosis (in animals and humans)" and member of the "European Union Reference Laboratory for Parasites" in Rome (Department of Infectious Diseases, Italian Institute of Health). He has long-standing experience in International Public Health research on zoonotic cestodes with special focus on molecular/clinical epidemiology, drugs, and biomarker discovery on cystic and alveolar echinococcosis. He is co-author of more than 80 scientific publications, is a reviewer for 25 international peer-reviewed journals and a member of the Editorial board of 3 journals, including Deputy Editor of "PLoS Neglected Tropical Diseases". He is also consultant for EFSA and ECDC on parasites. He is the Project Coordinator of several international granted collaborative projects.

PROGRAM

15 November 2018 Thursday

08.30-09.30	**Registration**	**At the venue of Irfan GUNSEL Congress Center** **NEAR EAST UNIVERSITY**
09.30-10.00	**Opening Ceremony**	
10.00-10.15	**Coffee Break**	
10.15-10.30	**Conference 1**	**Chair: Prof. Dr. Nazmiye ALTINTAS** **Global progress on the management and control of echinococcosis** *Dr. Bernadette ABELA-RIDDER (WHO)*
10.30-11.00	**Conference 2**	**Chair: Prof. Dr. Okan AKHAN** **Cystic Echinococcosis – The effort of the WHO Informal Working Group (IWGE) to improve patient care** *Prof. Dr. Thomas JUNGHANS (Germany)*
11.00-11.30	**Conference 3**	**Chair: Prof. Dr. Gamze MOCAN** **Echinococcosis and control situation in Turkey** *Prof. Dr. Nazmiye ALTINTAS (Turkey)*
11.30-12.00	**Conference 4**	**Chair: Prof.Dr. Hasan BESIM** **History of hydatid disease** *Prof. Dr. Marianna KARAMANOU (Greece)*
12.00-12.30	**Conference 5**	**Chair: Assoc. Prof. Kaya SUER** **Cystic Echinococcosis in Cyprus** *Ass.Prof.Emrah RUH (North Cyprus)*
12.30-13.30	**LUNCH**	
13.30-14.30	**Case Presentations**	**Chair: Prof. Dr. Iskender SAYEK** *Prof.Dr.Okan AKHAN* *Prof.Dr.Cuneyt KAYAALP* *Prof.Dr.Hasan BESIM*
14.30-15.00	**Oral Presentations** **OP 1** **OP 2**	**Chair: Prof.Dr.Turgut IMIR** **Evauation of the ability of antigen B originated from G1 and G6 strains of *Echinococcus granulosus* for the diagnosis of confirmed human hydatid cysts using ELISA** *Seyed Mahmoud SADJJADI,Tahereh MOHAMMADZADEH* **Investigation of Intraspecific variability of *Echinococcus granulosus* sensu stricto (s.s) from human host** *Serra ORSTEN, Turkmen CIFTCI, Gokhan YUCE, Emre UNAL, Aynur AZIZOVA, Ahmet Bulent DOGRUL, Devrim AKINCI, Okan AKHAN*
15.00-15.30	**Coffee Break**	
15.30-16.30	**Round Table**	**Chairs: Prof. Dr. Iskender SAYEK , Prof. Dr.Nazmiye ALTINTAS** **Data quality in the global literature on Echinococcus / echinococcosis : a narrative appraisal of systematic reviews** *Prof.Dr.Adriano CASULLI (Italy)* **Turkey's contributions on world literature about Echinococcosis and hydatid disease** *Prof. Dr. Iskender SAYEK (Turkey)* **Is a journal about *Echinococcus* necessary? Is time come?**

		Prof.Dr.Cuneyt KAYAALP (Turkey)
16.30-17.30	**Oral Presentations** **OP3** **OP 4** **OP 5** **OP 6**	**Chairs: Prof.Dr.Hakan ERPEK, Dr.Ali OZANT** **Hydatid cysts in pediatric patients: A tertiary center experience** *Senay ERDOGAN DURMUS, Sebnem BATUR, Nuray KEPIL* **Anesthesia Management in Hydatid Cysts** *Yeliz SAHINER* **Numerical changes in Echinococcus alveolaris materials in Erzurum in last 40 years** *Ali KURT* **Evaluation of atypical localizations in human cystic echinococcosis cases** *Mesut AKIL, Ulku KARAMAN, Nazmiye ALTINTAS*
17.30-18.30	**WHO-IWGE Meeting**	
18.30	**COCTAIL**	

16 November 2018 Friday

08.30-09.30	**Oral Presentations** **OP 7** **OP 8** **OP 9** **OP 10**	**Chair: Ass. Prof.Dr.Kalbim ARSLAN, Ass.Prof.Emrah RUH** **Examination of hydatid cyst mimics in the liver with two cases** *Havva ERDEM, Ulku KARAMAN* **Hydatid cysts in adult patients: a 17 years experience in a tertiary center** *Senay ERDOGAN DURMUS, Ahu Sanem DEMIROZ, Nil COMUNOGLU* **A Case of Pulmonary Artery Hydatid Cyst** *Ahmet ULUSAN* **Validation of numune scoring system in hepatic hydatid cyst patients who have been treated with PAIR** *Birkan BIRBEN,Sadettin ER, Sabri ÖZDEN, Mehmet KEŞEK ve Mesut TEZ*
09.30-10.00	**Conference 6**	**Chair: Prof.Dr. Aysegul UNVER** **Cystic echinococcosis in Romania : experience from Heracles project** *Prof.Dr.Carmen-Michaela CRETU (Romania)*
10.00-10.30	**Coffee Break**	
10.30-11.00	**Conference 7**	**Chair: Prof. Dr. César Gavidia CHUCÁN** **Ecohealth /one health and *Echinococcus* transmission** *Prof. Dr. Patrick GIRAUDOUX (France)*
11.00-11.30	**Conference 8**	**Chair: Asc. Prof.Necdet OZCAY** **Alveolar echinococcosis : focus on transmission, susceptibility and early diagnosis** *Prof. Dr. Peter DEPLAZES (Switzerland)*
11.30-12.30	**Oral Presentations** **OP 11**	**Chair: Asc.Prof. Nuray ALTINTAS, Asc.Prof.Ulku KARAMAN** **Evaluation of native and multiepitope recombinant (recDipol) antigen in diagnosis and follow up of patients with cystic**

		echinococcosis *Eylem AKDUR OZTURK, Mesut AKIL, Halil BOZKAYA, Zafer DOKUMCU, Emre DIVARCI, Omer Vedat UNALP, Carlos Sanchez OVEJERO, Raul Manzano ROMAN, Adriano Casulli, Mar SILES LUCAS, Aysegul UNVER,Nazmiye ALTINTAS*
	OP 12	**Spontaneously ruptured hydatid cyst cases : a single center experience** *Ebru SENER*
	OP 13	**Splenic hydatid cysts : a single center experience** *Yasemin ALTINTAS*
	OP 14	***Abdominal cystic echinococcosis: a hospital based study*** *Mehmet BAYRAK*
12.30-13.30	**LUNCH**	
13.30-14.00	**Conference 9**	**Chair: Prof. Dr. Nazmiye ALTINTAS** **Organization of the cystic echinococcosis pilot control program in Peru** *Cesar M. GAVIDIA*
14.00-14.30	**Conference 10**	**Chair: Prof.Dr.Nedim CAKIR** **Whats new in medical treatment of hydatid disease?** *Assoc.Prof.Dr.Kaya SUER (North Cyprus)*
14.30-15.00	**Conference 11**	**Chair: Prof. Dr. Cuneyt KAYAALP** **Percutaneous treatment of liver CE: What is new?** *Prof. Dr. Okan AKHAN (Turkey)*
15.00-15.30	**Coffee Break**	
15.30-16.00	**Conference 12**	**Chair: Prof. Dr. Thomas JUNGHANS** **HERACLES project, ERCE clinical register and the burden of cystic echinococcosis in Europe and Turkey** *Prof.Dr.Adriano Casulli (Italy)*
16.00-16.30	**Conference 13**	**Chair: Prof.Dr.Peter Deplazes** **Is a single diagnostic antigen for human cystic echinococcosis the best option?** *Prof.Dr.Michael ROGAN (United Kingdom)*
16.30-17.45	**Oral Presentations**	**Chair: Prof. Dr. Cinar YASTI**
	OP 15	**Liver hydatid cysts: our experiences in a tertiary referral centre** *Refik BADEMCI, Yasar OZDENKAYA*
	OP 16	**Primary hydatid cyst in interpectoral area** *Murat KANLIOZ*
	OP 17	**Liver hydatid cyst; the Hitit University experience** *Murathan ERKENT, Ibrahim Tayfun SAHINER,Murat KENDİRCİ,Mesut BALA, Ramazan TOPÇU, Murat Baki YILDIRIM, Murat Bulut ÖZKAN, Settar BOSTANOĞLU, Mete DOLAPÇI*
	OP 18	**Comparison of serum glutathione values in those with hydatid cyst and *Toxoplasma gondii* seropositivity and *Entamoeba coli* and *Enteriobus vermicularis* positivity** *Tugba Raika KIRAN, Ulku KARAMAN, Yeliz KASKO ARICI*

	OP 19 OP 20	**Laparoscopic hydatid cyst experiences** *Huseyin EKEN, Eray KURNAZ* **A Rare cause of abdominal pain; Paraduodenal Giant Hydatid Cyst** *Murathan ERKENT, İbrahim Tayfun ŞAHİNER*
18.00-18.30	**Closing Ceremony**	
20.00	**GALA DINNER**	**20.0**

17 November 2018 Saturday

08.45 – 14.30	**Nicosia Walled City Tour (Free)**  ©Old Nicosia walls | by mia papia	With transport from the Hotel/Residence, a walking tour organized to give an impression of the north of the city, describing the evolution of an development with the influence of different cultures like the Lusignans, Venetians, Ottomans and British Empire. It is roughly a two hour tour starting from the Kyrenia Gate historically known as "Porta del Proveditore. Mevlevi Museum, Samanbahçe Houses, Venetian Column, Great Inn, Gamblers Inn, Selimiye Mosque (St Sophia Cathedral) and Arasta (the pedestrianized market street) and Bandabuliya will be visited. Green Line dividing the North and South parts of the city will also be seen. Et the completion there will be a transport back to the hotels. **Free time will be available for shopping and lunch between 12:30 and 14:00 (own expense).**

CONFERENCES

Conference 1	**Global progress on the management and control of echinococcosis** *Dr. Bernadette ABELA-RIDDER (WHO)*
Conference 2	**Cystic Echinococcosis – The effort of the WHO Informal Working Group (IWGE) to improve patient care** *Prof. Dr. Thomas JUNGHANS (Germany)*
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Conference 9	**Organization of the pilot program in Peru** *Prof. Dr. César Gavidia CHUCÁN (Peru)*
Conference 10	**Whats New in Medical Treatment of Hydatid Disease** *Assoc.Prof.Dr.Kaya SUER (North Cyprus)*
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Conference 12	**HERACLES project, ERCE clinical register and the burden of cystic echinococcosis in Europe and Turkey** *Prof.Dr.Adriano Casulli (Italy)*
Conference 13	**Is a single diagnostic antigen for human cystic echinococcosis the best option?** *Anthony Bodell, Judy Mwangi, Eberhard Zeyhle, Philip Craig, and Michael Rogan (United Kingdom)*

Conference 1

Conference 2

CYSTIC ECHINOCOCCOSIS – THE EFFORT OF THE WHO INFORMAL WORKING GROUP (IWGE) TO IMPROVE PATIENT CARE

Thomas JUNGHANS
Head of the Section Clinical Tropical Medicine, Department of Infectious Diseases, Heidelberg University Hospital , Heidelberg / GERMANY
Chair of the WHO Informal Working Group on Echinococcosis (WHO-IWGE).

Most clinicians agree in principle on the four CE treatment options: drugs, percutaneous methods, surgery and "watch and wait". The preferences of experts are based on cyst stage, cyst localization, resources and training. Few algorithms have been tested systematically in comparative trials, and the preferred treatments have mainly been based on the evidence of small studies. Overall, much remains to be tested and defined.

With the concerted action of WHO-IWGE to publish pragmatic technical manuals, substantial progress can be made to the benefit of patients. The manuals should give practical advice based on current updated evidence and define specific issues in the risks and benefits of current treatment options, given the infrastructure, access to treatment, experience and quality of the health care institutions where patients are treated. The current state of the development of the 'CE Technical Manual' is presented.

Conference 3

ECHINOCOCCOSIS AND CONTROL SITUATION IN TURKEY

Nazmiye ALTINTAS

Ege University, Faculty of Medicine, Department of Parasitology, Bornova-IZMIR, TURKEY

President of Turkish Association of Hydatidology (TAH)

Two forms of echinococcosis which namely cystic echinococcosis (CE) caused by *E. granulosus* and alveolar echinococcosis (AE) caused by *E. multilocularis* have been seeninTurkey. Although CE has been encountered throughout Turkey, AE has predominantly been limited to the eastern Anatolian region of the country which has cold climate and high altitude (Altintas, 1998; Altintas et.al., 1999; Altintas et.al., 2006; Pektas, et.al., 2014). Although echinococcosis has been recognized in Turkey since 1861, a consistent state policy for disease prevention and control has not been developed and continues to be a major health problem. The main reason for facing this public threat in Turkey is because this topic has not yet become a priority for the authorities. Exposure of humans to *E. granulosus* is common in Turkey due to the lifestyle of the population who live in close proximity to sheep and dogs. Most people live in rural areas and are engaged in animal husbandry. The public awareness on this issue is very low. People are generally poorly educated in health and preventive medicine issues. Once a year, a sacrificial festival is held during which a lot of sheep and cattle are slaughtered. And the meat of infected intermediate hosts is commonly fed to stray dogs. Livestock is also slaughtered for daily meat requirements, with a high proportion of uncontrolled slaughter which facilitates transmission of the parasite.

Although the present number of stray dogs and owned dogs is unknown in Turkey, according to some of the local studies, *E. granulosus* infection in dogs ranges between 0.32% and 40% (Tinar, R, et al., 2001). The prevalence of CE in domestic animals ranges from 3.5% to 58.6% has varied widely with geographical location (Tinar and Coskun, 1991). In humans, Altintas (2003) reported that the estimated surgical cases rates ranged from 0.87 to 6.6 per 100,000 inhabitants between 1987 and 1994. A retrospective study based on hospital, regional and ministerial documents showed that, from 2001 to 2005, a total of 14,789 CE surgical cases were recorded, of which 13.13% in the Marmara region, 16.94% in the Aegean region, 16.09% in the Mediterranean region, 38.57% in the Middle Anatolian region, 5.70%, in the Black Sea region, 6.80% in the eastern Anatolian region and 2.75% in the south-eastern Anatolian region . Still numerous human cases are reported regularly from medical centres in different parts of the country.

The accurate identification of parasites and their genetic characterisation also have important implications; for systematics (taxonomy and phylogeny), population genetics, ecology and epidemiology, diagnosis, treatment and control of the diseases they cause. Predominant genotype of *E. granulosus* in Turkey is the G1 strain infecting humans, cattle, sheep, goats, camels, but the pig strain G7 first time was found in three isolates from sheep and human by Snabel, Altintas et al. in 2009.

Control programme development has been started to discuss with the authorities from Ministry of Health and Ministry of Agriculture after establishing the Turkish Association of Hydatidology (TAH) in 1999. TAH is the only Non Governmental Organization (NGO) in Turkey that works on "cystic echinococcosis". Then CE became a "notifiable disease" in 2005 by Ministry of Health. But still there is no accurate information about the disease because of surveillance system. Actually CE is a disease that poses a threat for public health and animal welfare and it can be taken under control if it is given the priority and if the necessary measures are taken by the authorities. So, CE urgently needs attention both for protecting public health and animal welfare in Turkey. Control programme, besides being realistic and adapted to local conditions, should be based on intersectoral involvement and coordination with particular emphasis on public health education and community participation. And still TAH continuing to develope on it.

Keywords: Echinococcosis,*Echinococcus granulosus, E.multilocularis, control, Turkey*

References

1. Altintas, N. Cystic and alveolar echinococcosis in Turkey. Ann. Trop. Med. Parasitol. 1998; 97 (6): 637-642.
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Conference 4

HISTORY OF HYDATID DISEASE

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Echinococcus sp. infection was widespread since antiquity and the first record of a hydatid disease is mentioned in Ebers's papyrus, dating to circa 1550 BC. A hydatid cyst was also detected in the lung of the mummy of Asru who was a chantress at the Karnak temple, during the 3rd intermediate period (1000-700 BC). In ancient Greece, hydatidosis was mentioned in the writings of Hippocrates (460-377 BC) as a liver filled with water while its lethal consequences, in case of eruption, were recognized too. The human involvement of hydatidosis was reported by several physicians such as Galen (130-201), Aretaeus of Cappadocia (2nd century AD), Rhazes (864-925) and Avicenna (980-1037). During Renaissance, the progress of anatomy, physiology, infectious diseases and pharmacology contributed to the foundation of parasitology as a distinct field of science related to human and veterinary medicine. In 1782, the German zoologist Johann August Ephraim Goeze (1731-1793) recognized the tapeworm scoleces and twenty years later, Carl Asmund Rudolphi (1771-1832), known as the "father of helminthology", introduced the name "echinococcus". In 1853, the German physician and botanist Philipp Franz Balthasar von Siebold (1796-1866) recognized after a series of experiments the cycle of animal transmission between the adult worm in the dog and hydatic cysts in sheep. Ten years later, Rudolf Leuckart (1822-1898) pointed out that *Taenia echinococcus multilocularis* represented a form of hydatid cyst. However, 19th century was marked by a scientific debate, on whether cystic echinococcosis and alveolar echinococcosis were caused by a single or by two different echinococcus species; a controversy which lasted 100 years and ended in 1957 thanks to Johannes Vogel (1900-1980) work. Currently, hydatic disease still remains an important heath issue in several parts of the world

Conference 5

CYSTIC ECHINOCOCCOSIS IN CYPRUS

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Cystic echinococcosis (CE) is a zoonosis that is developed by the larval stages of *Echinococcus granulosus sensu lato (s.l.)*. In the life cycle of the parasite, dogs and other canids are the definitive hosts, and ungulates such as sheep and goats are the intermediate hosts. Humans are accidental intermediate hosts for the parasite.

Cyprus is an island situated in the eastern part of Mediterranean Region where echinococcosis is endemic. The disease was commonly encountered in the island until 1970s. In Southern Cyprus, two control programmes were conducted for echinococcosis. The first programme was implemented between 1971 and 1985, while the second one was initiated in 1993. As a result of the control programmes, disease prevalence decreased in dogs and livestock. Between 1997 and 2005, a control programme was conducted in Northern Cyprus. Due to this programme, disease rates declined in definitive and intermediate hosts. However, the prevalence increased after the programme was terminated.

Recently, sporadic cases of echinococcosis have been reported in Cyprus. Therefore, control programmes should be continued, and the public awareness on echinococcosis should be increased particularly in Northern Cyprus.

Conference 6

ALLOCATION OF ROMANIAN PATIENTS WITH CE TO THE APPROPRIATE TREATMENT, IN THE FRAME OF HERACLES PROJECT

Carmen-Michaela CRETU

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Cystic echinococcosis is a common parasitic zoonosis in Romania. The recent studies, in the context of European FP7 Project – HERACLES, emphasize the magnitude of the disease on our territory. The aim of this study is to analyze 2 cohorts of patients: survey patients - positive cases discovered during the ultrasound screening in different regions of Romania and prospective patients - new cases admitted in Parasitology Department of Colentina Clinical Hospital from October 2013 till March 2017. All patients signed the consent form of the study and agreed to be registered in the European Register of CE. They were trreated as per WHO-IWGE recommendations.

During the US survey a total number of 7469 persons, selected from 5 counties were enrolled and screened; we found 127 suspected CE patients, out of which a number of 28 were new cases, history of CE 39 cases, relapses 7 cases, CL 28 cases; we excluded from the study 25 cases (not confirmed). All US type of cysts, WHO classification, were found, with different sizes (2-22 cm diameter). In spite of a higher rate of female participants (75%), the discovery rate for CE was predominant in males. In positive cases all the age groups were involved, but most of the cases belonged to adult population, older than 30 years of age. All the positive cases were evaluated, treated and followed up according to the protocol and finally registered in ERCE. CE cases were found in all the visited villages. Allocation of patients to the treatment: ABZ alone 21, ABZ temptative 1, Surgery 9, Dg puncture 9, PAIR 1, W&W 35, under observation 54. The follow up was done every 6-12 months, with very limited compliance.

Prospective patients: 442 new cases were admitted in the project period, harbouring 722 echinococcal cysts. Age was between 1-90 y.o. (average: 47.45 y.o.), female being 257 (58.14%). No significant statistical difference was observed for residence (Urban *versus* Rural, 45.9/54.1%). Minimum number of cysts/person: 1; maximum: over 30. Cyst size: <5cm: 365, 5-10cm: 277, >10cm: 80. Primary cystic echinococcosis: 338 cases (76.47%). Relapses: 84 cases, occurred 1-10 years after previous treatment. Location: liver cysts: 552 (76.45%) and other organs: 170 (23.55%), including but not limited to lungs, spleen, peritoneum, kidney, heart, CNS. According to WHO-IWGE classification, the 658 cysts that could be explored by ultrasound were CL=28, CE1=217, CE2=70, CE3a=69, CE3b=85, CE4=133; CE5=35, residual cavities=21. Allocation of patients (cysts) to clinical management options: albendazole alone 135 (278 cysts), surgery 160 (225), percutaneous drainage 45 (57), watch and wait 81 (110), CL-no treatment 8 (28), combined methods 13 (24). Patients' follow-up was done in 330 cases: improvement 264; stable 58; no response 4; death 3; worsened 1; 112 were not compliant. Albendazole as single therapeutic option and associated to surgery was recommended in 340 cases with 45 (13.24%) side effects: increased liver enzymes 40, alopecia 4, abdominal pain 1. We collected 119 cysts samples, of which 90 with viable protoscoleces. Genotyping performed on 32 samples identified G1-G3 genotypes.

The presence of CE in children population and the high number of new cases emphasize that cystic echinococcosis is a serious health problem in Romania and a sustained control program is obviously necessary to be implemented.

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Conference 7

ECOHEALTH/ONE HEALTH AND ECHINOCOCCUS TRANSMISSION

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Infectious disease transmission is increasingly thought to be the result of the systemic integration of complex links between the health of all species and that of their environment. This field of research and application is being popularized in the term of "One Health", itself encapsulated in the term "Ecohealth". The life-cycles of *Echinococcus* species range from merely sylvatic to merely domestic. Furthermore, several species and genotypes can co-exist locally in the same ecosystem. The diversity of *Echinococcus* species and genotypes, the number of host species and the variety of community lifestyles pose substantial problems when it comes to understand life-cycle and exposure routes and develop relevant strategies for control. Understanding *Echinococcus* transmission and achieving successful control is dependent on developing parallel paths, bridges and sustainable long-term interactions between disciplines (ecology, geography, population genetics, modelling, anthropology, economics, health sciences and clinics, etc.) and sectors (e.g. pest control, conservation, public health, socio-economy, land use and land management, etc.). Based on examples, here we present an overview about world ecosystems conducive to *Echinococcus* parasite transmission, and how anthropogenic disturbance can or do lead to transmission re-enforcement, sustained stability or to extinction in various conditions. We present why systems approach is essential to insert *Echinococcus* control in a larger scope where ultimate and proximate causes of transmission can together be taken into account.

Conference 8

ALVEOLAR ECHINOCOCCOSIS: FOCUS ON TRANSMISSION, SUSCEPTIBILITY AND EARLY DIAGNOSIS

Peter DEPLAZES

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Keywords: Echinococcus multilocularis, early infection, susceptibility, diagnosis

In Europe, red foxes (Vulpes vulpes) are the main definitive hosts of E. multilocularis. However, raccoon dogs (Nyctereutes procyonoides) and other wild canids may contribute to the lifecycle which involves voles (Arvicola sp., Microtus sp.) as primary intermediate hosts. Domestic dogs are also susceptible to intestinal tapeworm infection and may contribute to the transmission of parasite eggs to humans by close contact. Humans can acquire alveolar echinococcosis (AE) after oral uptake of infective eggs. However, transmission pathways are not well understood and probably vary within endemic areas (rural or urban environments) and are dependent on socio-cultural and economic factors. The transmission has been hypothetically linked to hand to mouth contact, or to water and foodborne sources (vegetables, fruits, berries). However, the attribution of infection sources performed by risk analyses is uncertain due to the long incubation time of AE (up to 15 years in humans).

There is no validated method for the isolation of Echinococcus eggs present on vegetables, and standardisation is difficult due to the heterogeneity of substrates (e.g., food matrices) involved. In general, after a washing step with water, the eluted parasites can be concentrated using flotation, sedimentation, and/or sieving steps and then detected by microscopy, PCR and sequencing using species-specific primers. A critical point that needs to be addressed is the fact that the detection of DNA from food sources does not confirm the presence of viable eggs.

Apparently, humans are highly resistant against intestinal E. multilocularis oncosphere invasion and subsequent development of AE in the liver. Evidence for this hypothesis is the relatively low number of clinical cases in Europe in areas with substantial egg contamination and by the relatively high number of calcified lesions with non-viable parasite. However, patients with impaired immunological status due to co-infections (e.g., HIV) or drug-based immunosuppression, show an increased risk for occurrence and severe progression of AE. Furthermore, reasons for the alarming high incidences of AE in Kyrgyzstan, China and other areas are still not well understood. Experimental evidence supports the involvement of innate immune mechanisms in the resistance to oncosphere invasion in a rat model. Immunocompetent rats are highly resistant to oral egg inoculations, however, after dexamethasone treatment or systemic depletion of granulocytes, hepatic AE development can be observed.

Early diagnosis of AE significantly improves the prognosis. For mass-screening of populations in risk areas, ultrasound (US) has been shown to be more sensitive compared to serological tests (sensitivity around 50% as compared with US positive results confirmed by genetic analyses). However, non-invasive diagnostic field tests to confirm putative US results are urgently needed.

Conference 9

ORGANIZATION OF THE CYSTIC ECHINOCOCCOSIS PILOT CONTROL PROGRAM IN PERU

Cesar M. GAVIDIA

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Cystic Echinococcosis (CE) still represents an important public health problem in many developing countries like Peru. Among the South American countries, Peru has the highest rate of CE infection in humans and animals (dogs and livestock). There has been only one attempt to control this zoonotic parasite by the end of the '70s with unsuccessful result. Recently, due to the coordination and support of Panamerican Health Organization, the Peruvian Veterinary Service (Ministry of Agriculture), Ministry of Health, and the National University of San Marcos, a Pilot Control Program was implemented by the end of 2014. Peruvian Government assigned the funds to start and maintain the Program for five years. The main goal was to evaluate different control strategies and to estimate the cost-effective of the intervention in 17 CE endemic communities in the Central and South Highlands of Peru. The strategies were: 1) praziquantel treatment in dogs every three months, 2) oxfendazole treatment in sheep older than one year, 3) sheep vaccination (EG95 vaccine) in lambs and every year. In addition, educational campaigns were organized with the small farmers and owners for all of the participant communities. The effect of the intervention would be assessed by testing dog fecal samples, sera from sheep, and ultrasound in humans annually. The Pilot Control Program is ongoing and data analysis will come in the next few months.

Conference 10

WHATS NEW IN MEDICAL TREATMENT OF HYDATID DISEASE?

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Cystic echinococcosis or hydatid cyst, which is common in certain regions of the world, may present a common health problem that can be encountered in each country.

Human echinococcosis is a zoonotic infection caused by the tapeworm of the genus *Echinococcus*. Of the four known species of *Echinococcus,* three are of medical importance in humans. These are *E granulosus,* causing cystic echinococcosis (CE); *E multilocularis,* causing alveolar echinococcosis (AE); and *E vogeli*. *E granulosus* is the most common of the three. *E multilocularis* is rare but is the most virulent, and *E vogeli* is the most rare.

Medical Care

Medical management differs for cystic echinococcosis (CE) and alveolar echinococcosis (AE). In CE, surgery remains the primary treatment and the only hope for complete cure. Better forms of chemotherapy and newer methods, such as the puncture, aspiration, injection, and reaspiration (PAIR) technique are now available but need to be tested. Currently, indications for these modes of therapy are restricted. In AE, radical surgical excision is coupled with chemotherapy in operable cases and long-term aggressive chemotherapy for partially resected or unresectable lesions. In CE, one should consider the risks and benefits, indications, and contraindications for each case before making a decision regarding the type and timing of surgery (1).

Two benzimidazolic drugs, mebendazole and albendazole, are the only anthelmintics effective against cystic echinococcosis. Albendazole and mebendazole are well tolerated but show different efficacy. Albendazole is significantly more effective than mebendazole in the treatment of liver cysts. Benzimidazole treatment alone requires prolonged administration over many weeks, with an unpredictable outcome in terms of response rates in individuals. Duration of therapy and doses are also important. Albendazole efficacy increases with courses of up to 3 months in the more common cyst sites. Patients once received these drugs in cycles of 4 weeks separated by 1-2 weeks without drugs. This regimen is no longer advocated given the parasitostatic activity of benzimidazoles and their safety as shown by cumulative data from several retrospective studies. Continuous treatment is preferred and has been administered for periods of up to 2 years without significant side effects. Praziquantel administered additionally once per week in a dose of 40 mg/kg during treatment with albendazole. However, available data are limited.

Chemotherapy in CE: Chemotherapy is indicated in patients with primary liver or lung cysts that are inoperable (because of location or medical condition), patients with cysts in 2 or more organs, and peritoneal cysts. Two benzimidazoles are used, albendazole and mebendazole. Albendazole is administered in several 1-month oral doses (10-15 mg/kg/d) separated by 1 intervals. New data for continuous treatment are emerging from China. The optimal period of treatment ranges from 3-6 months, with no further increase in the incidence of adverse effects if this period is prolonged. Mebendazole is also administered for 3-6 months orally in dosages of 40-50 mg/kg/d. Limited data are available on the weekly use of praziquantel, an isoquinoline derivative, at a dose of 40 mg/kg/wk, especially in cases in which intraoperative spillage has occurred. Albendazole has been found ineffective in the treatment of primary liver cysts in patients who are surgical candidates.

Chemotherapy in AE: Chemotherapy with benzimidazoles is used perioperatively for approximately 2 years in patients in whom radical resection is feasible because of possible undetected residual parasite tissue.

PAIR in CE: The PAIR technique is performed using either ultrasound or computed tomography (CT) guidance, involves aspiration of the cyst contents via a special cannula, followed by injection of a scolicidal agent for at least 15 minutes, and then reaspiration of the cystic contents. This is repeated until the return is clear. The cyst is then filled with isotonic sodium chloride solution. Perioperative treatment with a benzimidazole is mandatory (4 d prior to the procedure and for 1-3 mo after).

In addition to chemotherapy and surgical interventions, scolocidal agents are available in the studies.

They evaluated the effects of chitosan-albendazole (ChABZ) and chitosan-praziquantel (ChPZQ) nanoparticles as a new formulation on hydatid cysts both in vitro and in vivo. The combination of ChABZ + ChPZQ nanoparticles was more effective than the ABZ + PZQ suspension in vitro ($p < 0.05$). In prophylaxy, a significant reduction was observed both in size and in number of the cysts in ChABZ + ChPZQ nanoparticle groups compared with the control group ($p < 0.05$) (2).

Novel compounds and more efficient treatment options are urgently needed for the treatment of cystic echinococcosis (CE), which is caused by *Echinococcus granulosus*. The decoction of *Sophora moorcroftiana* (Fabaceae) has been used to treat parasitosis for years in traditional Tibetan medicine. The aim of this study was to screen insecticidal water-soluble alkaloids from *S. moorcroftiana* seeds and evaluate the therapeutic effects against CE and the immune response induced by the alkaloidal fraction (3).

The E2-a fraction of *S. moorcroftiana* can inhibit the cyst development of CE and boost the specific immune response by reducing the expression of PD-1 and accelerate the cytokine secretion of antigen-specific T-cells.
The E2-a fraction of *S. moorcroftiana* can inhibit the cyst development of CE and boost the specific immune response by reducing the expression of PD-1 and accelerate the cytokine secretion of antigen-specific T-cells.
All data suggest the E2-a fraction from *S. Moorcroftiana* seeds may be used as a new potential therapeutic option against *E. granulosus* infection (3).

Surgery is the preferred treatment for hydatid cyst (cystic echino coccosis, CE). At present, various scolicidal agents have been used for inactivation of protoscoleces during surgery, but they are associated with adverse side effects. The aim of the present study was to evaluate the scolicidal effects of amphotricin B, Silver nano particles, *Foeniculum vulgare Mill*, essential oil and hypertonic saline against protoscoleces *of hydatid cyst* on an in vitro model. The results indicated weak scolicidal activity of AmB and Ag-NPs; whereas *F. vulgare* essential oil had potent scolicidal activity against protoscoleces *of hydatid cyst* that revealed the potential of *F. vulgare* as a natural source for the pro-duction of new scolicidal agent for use in hydatid cyst surgery (4).

Total antioxidant status (TAS), total oxidant status (TOS) and oxidative stress index (OSI), nitric oxide (NO), zinc (Zn), copper (Cu) levels, paraoxonase (PON1), arylesterase (ARES) activities, and biochemical changes were studied on sheep with cystic echinococcosis. PON1 and ARES activities increased in sheep infected with cyst hydatid. The decline of antioxidant reserves in the metabolism results in excessive amounts of free radicals, along with alterations of the normal histological structure of the cystic organ and changes in trace element metabolism (5).

Radiotherapy is commonly used to treat cancers. To date, there has been no study focusing on the effects of radiotherapy on hydatid disease in large animals. In this study, we aim to investigate the efficiency and safety of radiotherapy for treating hydatid disease caused by Echinococcus granulosus in naturally infected sheep. Radiotherapy is an option with satisfactory efficiency and safety for treating cystic echinococcosis in sheep with partial response or stable disease at month 3. In future, inhibition of cystic activity using radiotherapy may serve as a new regimen for treating hydatid disease (6).

In this study, the scolicidal effect of ultrasonic methanol extract of Garlic (*Allium sativum*) flower is investigated. Garlic flower extracts is a potent protoscolicid and might be used in hydatid cyst treatment and pre-surgery to prevent secondary cyst recurrence (7).

The objective of this study was determination of the scolicidal effect of two fungal chitosan types, produced from Penicillium spp. and commercially chitosan (CC) on Echinococcus granulosus protoscolex. Protoscolices were aseptically aspirated from sheep livers hydatid cysts. Four concentrations (50, 100, 200, 400 lg/ml) of each type of prepared chitosan were used for 10, 30, 60 and 180 min.Viability of protoscolices was detected by 0.1 % eosin staining. Fungal chitosan which was the most bioactive type with higher degree of deacetylation showed stronger scolicidal activity in vitro (P\0.05). Fungal chitosan could be recommended, as good as CC for hydatid cystscontrol and is a noble alternative for synthetic and chemical scolicidal (8).

The present study aimed to evaluate the in vitro scolicidal effect of *Nigella sativa* (Ranunculaceae) essential oil and also its active principle, thymoquinone, against protoscolices of hydatid cysts. Protoscolices were aseptically aspirated from sheep livers having hydatid cysts. The results of this study indicated the potential of *N. sativa* as a natural source for production of a new scolicidal agent for use in hydatid cyst surgery (9).

In the examples mentioned above, researches are continuing in hydatid cysts. As in the treatment of HIV or HCV, new treatment modalities are expected to be found in hydatid treatment.

PERCUTANEOUS TREATMENT OF LIVER CE: WHAT IS NEW?

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Percutaneous treatment for the management of liver CE is applied by using three techniques according to the stage-specific approach. The major indication for percutaneous treatment of liver hydatid cysts is the viability of CE. According to WHO classification, active (CE1 and CE2) and transitional zone CE (CE 3a and b) should be treated by any means. The patients with CE 4 and CE 5 should be managed by “Wait and Watch approach” since no treatment is indicated in these patients. The hydatid cysts which are perforated into biliary system, peritoneum and pleura are indicated for surgical treatment as a first option.

The long-term results of percutaneous approach for liver CE1 and CE 3a are very successful (reported to be over 97%). PT is associated with lower complication and recurrence rates and shorter hospital stay in comparison with the results of surgery for this group of liver CE. Our unpublished data are associated with 10% of major complication, 3.5% of recurrences and 3 days for hospital stay in 300 patients with 500 liver with CE 1 and 3a.

Seventy-three patients (37 male, 36 female; 75 cysts) with CE types 2 and 3b who underwent percutaneous treatment were treated by a new percutaneous technique named MoCaT. Patients were 6–79 years old. Twenty-three cysts (30.6%) were treated with PAIR, 26 (34.7%) with standard catheterization, and 26 (34.7%) with the modified catheterization technique. Among all patients, the cysts decreased in volume by 61.1% (range, 5–100%). Cysts recurred in 11 (47.8%) patients treated with PAIR, three (11.5%) treated with standard catheterization, and one (3.8%) treated with the Modified catheterization technique (MoCaT). Twelve (16.4%) major and 16 (21.9%) minor complications developed. Treatment of CE types 2 and 3b with the modified catheterization technique (MoCaT) was associated with a recurrence rate lower than what is seen with other techniques, and therefore it appears to be a safe, reliable, and efficient alternative

Percutaneous approach is also a first treatment alternative to surgery for HC located in the liver whenever it is indicated.

Conference 12

HERACLES PROJECT, ERCE CLINICAL REGISTER AND THE BURDEN OF CYSTIC ECHINOCOCCOSIS IN EUROPE AND TURKEY

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Key words – Public health; cystic echinococcosis; international collaborative project; clinical register; drugs; burden of disease.

Objective

Cystic Echinococcosis (CE) is one of the most important zoonotic diseases worldwide and it is prioritized by the World Health Organization (WHO) as Neglected Tropical Disease (http://www.who.int/neglected_diseases/news/new-approach-needeed-to-tackle-echinococcosis-europe/en/). 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 European Union 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.

Materials and Methods

The main goals of the HERACLES international collaborative 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.

Results and Conclusions.

Current core achievements are:

1) Creation of the “Heracles Extended Network” with more than 60 centers from 30 countries (http://www.heracles-fp7.eu/interactive_map.html);

2) Completion of the biggest research-based cross-sectional study (ultrasound-based) on CE ever done (N=24,693), estimating 151,000 people infected in rural Romania, Bulgaria and Turkey (http://www.heracles-fp7.eu/heracles_survey.html; Tamarozzi et al., 2018);

3) Creation of the European Register as a case series for data analysis on clinical management of CE with around 2,000 patients from 30 centres (http://www.heracles-fp7.eu/erce.html (Rossi et al., 2016);

4) European patent on anti-parasitic soluble drugs: “Salts of compounds having a benzimidazolic structure“ (PCT/IT2016/000191) (Ferretti et al., 2017; Cirilli et al., 2017; Carmena et al., 2018);

5) Creation of the registered Echino-Biobank to sustain experimental and clinical research in this field (N≈4,500 samples) (Manzano-Román et al., 2015; Hernández-González et al., 2018);

6) Worldwide collection of human cyst samples for genotyping studies (N=742) (Orsten et al., 2018);

7) First proteomic description of parasite exosomes in fertile hydatid cyst fluid(Sánchez-Ovejero et al., 2017); 8) Scientific papers published in peer-reviewed journals: 54 (http://www.heracles-fp7.eu/publications.html).

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 breakthrough in the current scenario of CE.

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Conference 13

IS A SINGLE DIAGNOSTIC ANTIGEN FOR HUMAN CYSTIC ECHINOCOCCOSIS THE BEST OPTION?

Michael ROGAN

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There have been numerous publications which attempt to optimise the best serodiagnostic antigens for human Cystic Echinococcosis derived either from hydatid cyst fluid or recombinant antigens, with sensitivities ranging from around 60-90%. However the significant variation that exists within cyst types (WHO Classification), size and location means that using one diagnostic antigen alone may not be the best option.

Objective

In this paper we aim to establish the differential recognition of a panel of recombinant *Echinococus* antigens by sera from patients from Turkana, Kenya with different cyst presentations. We have also monitored antibody levels in individual patients followed-up over time against the same panel of antigens.

Materials and methods

Serum samples were collected as part of the African Medical & Research Foundation (AMREF) Hydatid Control Programme, in Lokichoggio, Turkana, Kenya. Each patient diagnosis was confirmed by ultrasound examination and was monitored at regular intervals by ultrasound prior to and during treatment with albendazole. The classification of cyst types observed was based on matching the ultrasonographers images and notes to the initial classification system of hydatid cysts (WHO-IWGE, 2003).

Recombinant Elongation factor 1(EF1-□□□□, Heat shock protein 70 (HSP70), Fatty Acid Binding Protein 1 (FABP1) and Thioredoxin Peroxidase TPx. ORFs were amplified from *E. granulosus* cDNA by PCR using primer sets respectively shown with *Nde*1 and *Bam*H1 restriction sites on the 5` prime ends of the sense and anti-sense strands. All inserts were directionally cloned into the pET19b expression vector carrying an N-terminal polyhistidine tag. Constructs were subsequently transformed into *Escherichia coli* BL21 (DE3) strain.

Sera were screened by ELISA detecting both total IgG activity and IgG subclasses. Antigenic activity was compared to crude sheep hydatid fluid as a reference point.

Results

In all cases OD values produced in ELISA against recombinant antigens were lower than with crude cyst fluid but this was also true for background activity with clinically negative individuals. Results showed that the diagnostic sensitivity of recombinant antigens varied. HSP70 performed as well as hydatid cyst fluid with sensitivities of between 92% and 94% for cyst types CE1-CE3 and 75% for CE4.The highest sensitivity with CE4 cysts was achieved with TPx (100%) although again the optical densities were low. EF1 was the least reacting antigen for all cyst types. More importantly it was clear that in many cases having a high response against one antigen did not necessarily mean that there would be a high response against all others. Similarly, in serological follow-up after albendazole treatment, antibody levels fluctuated within individual patients but the same fluctuations did not always occur with each antigen.

Conclusion

The variability in cyst structure between individual patients and within the same patient over time means that the host will be exposed to different parasite antigens at different times. For diagnosis and follow-up it may therefore be better to employ a panel of different antigens rather that searching for the perfect single antigen.

Round Table

Chairs:

Prof. Dr. Iskender SAYEK

Prof. Dr.Nazmiye ALTINTAS

“Data quality in the global literature on Echinococcus/echinococcosis: a narrative appraisal of systematic” reviews

Prof.Dr.Adriano Casulli (Italy)

Turkey’s contributions on world literature about Echinococcosis and hydatid disease

Prof. Dr. Iskender SAYEK (Turkey)

Is a journal about Echinococcus necessary? Is time come?

Prof.Dr.Cuneyt KAYAALP (Turkey)

Data quality in the global literature on Echinococcus/echinococcosis: a narrative appraisal of systematic reviews

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Key words – cystic echinococcosis; alveolar echinococcosis; Echinococcus granulosus; Echinococcus multilocularis; data quality; systematic reviews.

Objective

Cystic (CE) and alveolar (AE) echinococcosis are among the most important zoonotic diseases worldwide and they are prioritized by the World Health Organization (WHO) for their control. A simple search in PubMed/Medline database using the terms "echinococcus OR echinococcosis OR hydatidosis" identified more than 21,000 peer review papers on this topic. This narrative review aimed to summarize the findings of relevant systematic reviews (SRs) on Echinococcus (granulosus and multilocularis), and echinococcosis (cystic and alveolar) in animals and humans.

Materials and Methods

A narrative review has been conducted on the most relevant systematic reviews (SR) generated in the field of Echinococcus/echinococcosis. PubMed/Medline database was searched for systematic review (SR) studies. No restrictions were placed on publication dates, geographical area or language. The online search, conducted on 1st October 2018, was carried out by combining keywords using Boolean operators AND/OR. The strategy developed in PubMed/Medline used queries for papers reporting abstracts on systematic reviews related to human and animal CE and AE. Thus, the final terms used for the search were "(systematic review[Title/Abstract]) AND (echinococcus OR echinococcosis OR hydatidosis)". Systematic reviews research studies published or in press were considered eligible for inclusion. Exclusion criteria were letters, editorials, review articles, or expert opinion papers not containing systematic review, duplicated data and studies on other causative agents.

Results and conclusions

From a total of 44 identified SRs, 13 were deleted by title and abstract. Thirty-one publications were retained for narrative discussion: 2 SRs focused on E. multilocularis/AE (1 on E. multilocularis in

animals and 1 on AE in humans), twenty-eight on E. granulosus/CE (3 in animals, twenty-two in humans, and 3 in both animal/humans) and 1 on both E. granulosus/E. multilocularis in animals. Of these thirty-one SRs eligible for inclusion, eighteen mainly focused on descriptive, clinical or molecular epidemiology of both parasites/diseases and thirteen on the clinical management of CE. Among the SRs on descriptive, clinical and molecular epidemiology, the following manuscripts were selected for narrative review: Budke et al., 2013, Otero-Abad et al., 2013, Oksanen et al., 2016, Possenti et al., 2016, Conraths et al., 2017. Among the SRs on clinical management, the following manuscripts were selected for narrative review: Stojkovic et al., 2009, Tamarozzi et al., 2014, Velasco-Tirado et al., 2018.

This narrative review analysed international peer-reviewed SR articles that have over the years contributed to our current understanding of the epidemiology and clinical management of E. granulosus/multilocularis and human CE/AE, respectively.

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Oral Presentations

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Oral Presentation 1

EVAUATION OF THE ABILITY OF ANTIGEN B ORIGINATED FROM G1 AND G6 STRAINS OF ECHINOCOCCUS GRANULOSUS FOR THE DIAGNOSIS OF CONFIRMED HUMAN HYDATID CYSTS USING ELISA

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Objectives: Cystic echinococcosis(CE) is an important zoonotic parasitic disease worldwide. Different strains of the parasite cause human CE, producing hydatid cyst in different organs especially in the liver. Several antigens have been used for serodiagnosis of the disease. The native antigen B has been suggested more by the scientists. Application of strain-specific antigen in serodiagnosis of human CE is important to prevent cross-reactions. Strain-specific AgB has not been utilized for serodiagnosis of CE, so, far. Keeping in mind, AgB originated from G1 and G6 strains of hydatid cyst, confirmed by molecular biology and sequencing was used for evaluation of their ability in the diagnosis of confirmed human CE.

Materials and Methods: Hydatid cyst fluid (HCF) was collected from sheep and camel cysts. The genotype of the cysts was confirmed by PCR and sequencing of cox1 and nad1 genes. The HCF of G1 and G6 strains were used for the preparation of AgB originated G1 and G6, respectively. A total of 45 sera samples from confirmed CE patients, 102 sera from healthy people as negative control and also 51 sera from other parasitic diseases including ascariasis, fascioliasis, giardiasis, hymenolepiasis, leishmaniasis, malaria, strongyloidiasis, toxocariasis, trichostrongyliasis, taeniasis, and toxoplasmosis were used for measurement of the diagnostic ability of antigen B originated from G1 or G6 strains of CE, alone or in combination by ELISA method. Sensitivity, specificity, validity, positive predictive value and negative predictive values were evaluated (95% CI).

Results: The results showed that 38(84.4%) out of 45 confirmed human CE were positive by ELISA using AgB originated from the G1 strain. This items for AgB originated from G6 strain was 39(86.6) out of 45. A total of 39(86.6%) out of 45 samples showed positivity by a combination of antigen B originated from G1 and G6 strains. Using the same procedure 17(33.3%) out of 51 and 5(10%) out of 51 other diseases sera showed positivity with AgB originated from G1 and G6 strains of CE respectively. A combination of AgB originated from G1 and G6 strains of CE showed 14(27%) out

of 51 to be positive. No sample sera from the control group(102) showed positivity by G1, G6 or combinations of AgBs originated from G1 and G6 strains of CE. The sensitivity, specificity, validity, positive and negative predictive values were measured to be 86.54, 85.71, 72.58, 93.58 for AgB originated from the G1 strain of CE and 88.24, 95.33, 94.44, 93.04 for AgB originated from the G6 strain of CE. These values for a combination of AgB originated from G1 and G6 strains of CE were 88.24, 87.93, 94.44, 88.02 respectively.

Conclusion: The ability of antigen B originated from the G1 strain of CE for diagnosis of confirmed cases of human liver CE is high. However, due to the diversity of the cyst strains in Iran, application of other prevalent strains of AgB alone or in combination with other strain sources is suggested.

Oral Presentation 2

INVESTIGATION OF INTRASPECIFIC VARIABILITY OF ECHINOCOCCUS GRANULOSUS SENSU STRICTO (S.S) FROM HUMAN HOST

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Objective

Cystic Echinococcosis (CE) is a globally-distributed zoonotic disease caused by larval forms of parasites which belongs to Echinococcus granulosus sensu latu (s.l.) which has been divided into 5 species as Echinococcus granulosus sensu stricto (s.s) (G1-G3 genotypes), Echinococcus equinus (G4 genotype), Echinococcus ortleppi (G5 genotype), Echinococcus canadensis (G6-G10 genotypes) and Echinococcus felidis. CE is one of the most common zoonotic diseases in Turkey, particularly in regions where the local population is actively engaged in animal breeding and is in constant close contact with sheep, cattle and dogs. Consistent with literature, E.granulosus s.s. is responsible for most of the human CE cases in Turkey. It is known that it has diversity in itself and limited data is available from human host. The aim of this study was to investigate intraspecific variability of E. granulosus s.s. and provide well defined clinical features of patients.

Materials and Methods

Hydatid cyst materials were collected from 12 patients who received percutaneous or surgical treatment for CE. Genomic DNA was extracted from cyst material using a commercial kit (Thermo, GeneJet Genomic DNA Purification Kit) and a fragment within the cytochrome c oxidase subunit 1 (cox 1) mitochondrial gene was amplified as previously described (Nakao et al 2000). Ampli?ed diagnostic products were visualized on agarose gels and resutls were considered positive when the band size of ~875 bp was obtained. All positive isolates were sequenced. Nucleotid sequence data analysis was carried out according to Boufana et al 2014. Briefly, all results checked by BLAST algorithm. Then, sequences were aligned by CLUSTALX2 software and transferred to DnaSP5 to show haplotype distribution.

Results

A total 12 patients (5 female, 7 male, mean age±32). According to WHO-IWGE classification system, 7 of the 12 hydatid cysts were classified as CE1, 2 as CE2, 1 as CE3a and 2 as CE3b. All the hydatid cyst fluids were examined by light microscopy for presence of protoscoleces and six of them determined as positive. Majority of the hydatid cysts were located in liver right lobe (5/12) and average cyst size was 7.2 cm. Serological test results were positive for 7 patients. Total 12 isolates were confirmed by BLAST algorithm as E. granulosus s.s. The majority of isolates (10/12) belonged to E. granulosus G1 whereas two of them were identified as G3 genotype. Haplotype analyses revealed the presence of, 6 haplotypes with a high genetic diversity (Hd= 0,682). The neutrality indices were both negative (Tajima?s D?0.683; p<0.2; Fu?s Fs?2.42; p<0.02).

Conclusion

In this study, we showed intraspecific variability in a small group of E.granulosus s.s. and well defined clinical characteristics of patients. However, it is impact on biological features is not clear which requires further studies with larger sample set.

Oral Presentation 3

HYDATID CYSTS IN PEDIATRIC PATIENTS: A TERTIARY CENTER EXPERIENCE

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Objective

To investigate the patient characteristics such as gender, age, localizations and histopathological features of hydatid cysts in pediatric patients.

Materials andMethods

We analyzed 71 patients that histopathologically diagnosed as hydatid cysts in Cerrahpasa Medical Faculty between 2000 and 2017, retrospectively. The data such as patients' characteristics, site of lesions, histopathological features collected from patients' pathology reports.

Results

Patient's mean age was 11.25±4.47 years (age range: 2–18 years), with a female to male ratio of 35: 36. There were 9 patients in < 6 years group, 26 patients in 6-11 years group and 36 patients in >11 years group. According to age distribution by gender; 17.14% (n:6) of female patients were in <6 years group, 37.14% (n:13) were in 6-11 years group and 45.71% (16) were in >11 years group. In male patients 8.33% (n:3) of patients were in <6 years group, 36.11% (n:13) were in 6-11 years group and 55.55% (n:20) were in >11 years group.

The most common localization in our patient group was liver (52.11%, n:37) and second most common localization was lungs (32.39%, n:23), followed by spleen (n:3), brain (n:3), abdomen (n:1), pleura (n:1), orbit (n:1), bone (n:1) and submandibular area (n:1). 20 out of 30 liver localized hydatid cysts were seen in female patients. 13 out of 23 lung localized hydatid cyst were seen male patients.

All cases more or less shared the same microscopic features of hydatid cyst such as avascular, eosinophilic, refractile, chitinous, thin laminated membrane beneath germinal layer; surrounded by a dense fibrous tissue with or without scolex.

Conclusion

The hydatid cyst in pediatric age group was more common in bigger child (>11 years) and slightly higher in male patients. Liver localized hydatid cysts were more common in female patients while lung localized hydatid cyst were more in male patients, in pediatric age population.

ANESTHESIA MANAGEMENT IN HYDATID CYSTS

Yeliz SAHINER

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Hydatid Cysts can move from the intestinal mucosa to the liver (60% to 70%) and to the lungs (20 to 25%) through portal circulation, but if they move into systemic circulation, they may settle into all organs and tissues including bone (10%). Intrathoracic complications that are often observed in hydatid pulmonary cysts cause systemic complications. Fever, itching, urticaria, eosinophilia, and anaphylaxis that the most serious complication can be seen in the cyst rupture. The cysts show symptoms according to their size and localization, whether perforated or not. Big cysts are diagnosed by the pressure to the pulmonary parenchyma and vital organs. In addition to dyspnea, cough is seen in treatment-resistant pneumonitis and atelectasis which is recovered after removal of the cyst. Cases of complex cyst may mimic different diseases radiologically and clinically. In cases of hydatid cyst of the liver, it may be seen that the cyst content is mixed into the blood circulation during surgery, or the solutions used to kill the scolex can cause anaphylactic reactions. The anaphylactic reaction that occurs during surgery can cause many symptoms. Although redness, urticaria, and edema are common, it may not be seen during the operation because the body of patient is covered. Severe arrhythmias and cardiovascular collapse may be observed if there is no early diagnosis of acute hypotension and tachycardia. Sometimes bronchospasm can also be encountered. The anesthesia procedure for patients may make it difficult to diagnose. Symptoms can sometimes be masked under general anesthesia and may be confused with the cardiac effects of intravenous and inhaler anesthetic substances. In patients undergoing regional anesthesia such as thoracic epidural anesthesia, it can be confused with the wrong settlement of the epidural injection or the systemic toxicity of local anesthetic medicines. To monitor the stage of the operation of the surgical team, the aggravation of the clinical symptoms after cyst aspiration will bring us closer to the diagnosis of anaphylaxis. In the treatment of anaphylactic shock, the cessation of anesthetic drugs firstly, the application of 100% oxygen support and rapid fluid resuscitation are important interventions. Due to the effect of vasoconstriction and bronchodilator, adrenaline may be the first option. In anesthesia management, H1 and H2 blocker agents, corticosteroids and aminophylline are beneficial. After the surgery, hypernatremia may develop due to hypertonic solutions manifested with convulsions as patients wake up. Since general anesthesia conceals hypernatremia, sodium values should be followed during the operation. The condition is more serious in the lung hydatid cyst. Mediastinal cysts may be

asymptomatic and may cause symptoms in early and late period. Due to the placement of the bronchogenic cysts, invasive diagnostic methods cannot be performed and they must be surgically removed and carry the specification in anesthesia management. As a general anesthesia method, single lung ventilation is performed using double-lumen endotracheal tube. It provides an advantage by ensuring that the lung is collapsed and preserving the other lung against aspiration. The deterioration of intrapulmonary shunts and arterial oxygenation then the hypoxic pulmonary vasoconstriction direct the blood flow from the atelectasis regions to the well-air areas and reduce intrapulmonary shunts. Studies have found that total intravenous anesthesia reduces intrapulmonary shunt rate compared to inhalation anesthesia. Caution should be maintained for hypoxia, hypercarbia and respiratory acidosis in the perioperative period. Finally, effective analgesia in the postoperative period allows us to avoid complications such as atelectasis and pneumonia of early mobilization.

Oral Presentation 5

NUMERICAL CHANGES IN ECHINOCOCCUS ALVEOLARIS MATERIALS IN ERZURUM IN LAST 40 YEARS

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ObjectiveMaterials And Methods

In this study, Echinococcusmultilocularis materials, which were diagnosed histopathologically in all hospitals and private clinics in Erzurum except Ataturk University Faculty of Medicine between 1978-2017 are presented.

Erzurum is located in Turkey's northeast.

Results and Conclusion

57 patients were male (52.3%) and 52 were female (47.7%). Cysts were located in 81 patients in liver (74.3%), in 17 patients in brain (15.6%), in three patients in lung and in abdominal cavity (2.8%), in one patient in cerebellum, kidney, bile, pleura and pericardium. There was no correlation between gender and organ involvement (p = 0.49). When the numbers of the patients, according to the city they live in, are examined; 73 (67%) from Erzurum, 9 (8.3) from Agri, 13 (11.9%) from Kars, 3 (2.7) from Mus, 4 (3.8) from Igdir, 2 (1.8%) from Van, 1 (0.9%) from Bingol, 3 (2.7%) from Ardahan and 1 (0.9) from Bayburt. The mean mass size was 4.52 cm, 4.91 cm in the liver and 4 cm in the brain. There wasn't a significant difference between the diameters of the cysts in the brain and liver (p 0.47). There was no correlation between the age of the patient and the diameter of the cyst (p 0.48). When the period of 40 years is examined in 10-year periods; it was observed that the incidence of cysts in the liver increased in the period of 1988-1997, decreased in the following periods. In the brain no patients were seen in the first two decades; 4 cases were seen in the third period and 13 cases in the fourth period. There was a correlation between organ involvement and decade (p 0.00). When we look at age in terms of organ involvement; the mean age was 39 in the liver and 38 in the brain (p 0.48).

Oral Presentation 6

EVALUATION OF ATYPICAL LOCALIZATIONS IN HUMAN CYSTIC ECHINOCOCCOSIS CASES

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Objective

Cystic echinococcosis is a one of most important helminthic diseases for human and animals. Human are infected by *Echinococcus granulosus* eggs which is found on dog feces (1). After ingestion of eggs, oncosphere is released in gastrointestinal tract, it penetrates the intestinal wall and pass through various organs via circulatory system. These organs are especially livers and lungs. However, it can rarely infect other organs such as brain, heart, spleen, kidney, bone, muscle etc. (2). Therefore, in this study we prepared a list of various atypical localizations in human cystic echinococcosis.

Maetrial and methods

In this study, we searched using the keywords "hydatid cyst, cystic echinococcosis and atypical localizations of hydatid cyst" in PubMed, Google Scholar and Web of Science databases. The research covered the case reports which included human cystic echinococcosis with unusual organs (except liver and lungs) that published in 2017 and 2018. The data of all the cases were entered in Microsoft Excel and performed a table included age, sex, organ localizations and country.

Results

Total 76 case reports which published in these two years were found. A total of 91 patients (age range: 5-86 years, mean of age: 37.09 and Standard deviation: 19,77) were analyzed. Fifty- two patients were female; 39 patients were male. The cyst localizations of patients were classified as "adrenal gland (n:1), appendix (n:1), blood vessel (n:2), breast tissue (n:2), cranium (n:22), eye (n:2), heart (n:12), kidney (n:4), mesentery (n:2), musculoskeletal system (n: 25), pancreas (n:5), peritoneum (n:4), pleura (n:4), spleen (n:2), sub-cutaneous tissue(n:1), uterus (n:1).

Conclusion

Hydatid cyst can be located not only in liver and lungs but also every organs and muscle. Most cases of our study were musculoskeletal system and cranium of unusual organs. Therefore, hydatid cyst should be considered in cystic diseases of any organs in body except hair and nails (3).

Keywords: Cystic echinococcosis, unusual organs, *Echinococcus*

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Oral Presentation 7

EXAMINATION OF HYDATID CYST MIMICS IN THE LIVER WITH TWO CASES

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Objective

Cystic liver lesions are commonly encountered in daily practice. Differential diagnosis includes a broad spectrum from clinically unimportant benign lesions to malignant lesions. These lesions may be associated with development, inflammation, neoplastic processes and trauma. Many cystic liver lesions have classic imaging findings and may be diagnosed with imaging alone. Additionally, lesions that cannot fully be defined or which mimic other lesions are commonly encountered in practice.

In the literature, mimicking lesions appear in substantial numbers. As a result, it is often necessary to discuss them clinically.

Case report 1

The case will be presented of a patient with ruptured spleen due to traffic accident. A cystic lesion was noted in the liver during surgery and resected and sent to the pathology laboratory.

Case report 2

Resected with hydatid cyst preliminary diagnosis and examined in terms of mimicking lesions.

Conclusion

In conclusion, it should not be forgotten that hydatid cyst cases may mimic liver lesions especially with cystic properties and inversely, cystic cases may mimic hydatid cysts. Hydatid cysts should definitely be remembered for differential diagnosis in Turkey.

Key words: hydatid cysts, mimics, liver

Oral Presentation 8

HYDATID CYST IN ADULT PATIENTS: A 17 YEARS EXPERIENCE IN A TERTIARY CENTER

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Objective

To investigate the patient characteristics such as gender, age, localizations and histopathological features of hydatid cysts in adult patients.

Materials and Methods

We analyzed 367 patients that histopathologically diagnosed as hydatid cysts in Cerrahpasa Medical Faculty between 2000 and 2017, retrospectively. The data such as patients' characteristics, site of lesions, histopathological features collected from patients' pathology reports.

Results

Patient's mean age was 44.17±16.02 years (age range: 19-89 years), with a female to male ratio of 211: 156. There were 164 patients in <40 years group, 134 patients in 40-60 years group and 69 patients in >60 years group. According to age distribution by gender; 43.60% (n:92) of female patients were in <40 years group, 37.91% (n:80) were in 40-60 years group and 18.49% (39) were in >60 years group. In male patients 50% (n:78) of patients were in <40 years group, 30.76% (n:48) were in 40-60 years group and 19.24% (n:30) were in >60 years group.

The most common localization in our patient group was liver (62.67%, n:230) and second most common localization was lungs (15.25%, n:56), followed by kidney (n:13), spleen (n:12), bone-muscle (12), abdomen (n:10), gall bladder (n:8), retroperitoneal (n:5), cardiac-paracardiac area (n:5), pleura (n:4), soft tissue (n:4). 132 out of 230 liver localized and 34 out of 56 lung hydatid cysts were seen in female patients. 7 out of 12 kidney localized and 4 out of 4 pleura localized hydatid cysts were seen male patients.

All cases more or less shared the same microscopic features of hydatid cyst such as avascular, eosinophilic, refractile, chitinous, thin laminated membrane beneath germinal layer with or without scolex; surrounded by a dense fibrous tissue.

Conclusion

The hydatid cyst in adult age group was more common in young adults (<40 years) and higher in female patients. Liver and lung localized hydatid cysts were more common in female patients while

kidney and pleura localized hydatid cysts were more common in male patients, in adult age population.

A CASE OF PULMONARY ARTERY HYDATID CYST

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Introduction

Hydatid cyst is a parasitic disease caused by usually *Echinococcus granulosus*, and rarely *Echinococcus multilocularis* which live in the intestinal system of animals such as cats and dogs. Cyst hydatid is most commonly located in the liver (60%) and subsequently in the lung (25%) (1). The likelihood of a pulmonary artery as a location for cyst hydatid is very low. It is usually secondary to cardiac or hepatic cyst ruptures and developed by pulmonary arteriovenous embolization. We wanted to present a case of the pulmonary artery cyst hydatid which is rarely reported in the literature.

Case

A 23-year-old male patient with a shortness of breath and cough complaints for approximately 3 months was admitted for diagnosis and treatment. Computed thorax angiography revealed a multiple cystic lesion in the right main pulmonary artery and right lung . No extra hydatid cyst focus was found elsewhere in the body. Right thoracotomy was performed in the case. The right main pulmonary artery was suspended and arteriotomy was performed. Cyst hydatid was detected from the common basal artery of the lower lobe to the proximal of the main pulmonary artery. Right pneumonectomy was performed on due to presence of common cystic lesions in the right lung. Albendazole treatment was applied for 6 months after the operation. After 3.5 years of surgery, there is no recurrence.

Discussion

Hydatid cyst disease, usually a slow-growing and easily treated disease, can be located in almost any tissue and lumen in the organism. The involvement of the pulmonary artery with echinococcal cysts is very rare and often occurs due to the embolization of female cysts from other organs such as the liver or heart (2 -3). We want to show that such rare cases should be included in our pre-diagnosis list in the patients presenting with similar lesions by presenting a case of the pulmonary artery cyst hydatid which is one of the rare and fatal cyst hydatid, and that surgical treatment can be successful in these cases.

Key words: Cyst Hydatid, Pulmonary Artery

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VALIDATION OF NUMUNE SCORING SYSTEM IN HEPATIC HYDATID CYST PATIENTS WHO HAVE BEEN TREATED WITH PAIR

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Objective
Percutaneous aspiration, injection and reaspiration (PAIR) is a safe and effective treatment for uncomplicated hydatid cysts (HC) and is associated with a shorter hospital stay(1). Hepatic HC are believed to communicate with the biliary system in ?80% of patients and this is a contraindication for intra-cystic injection of sclerosing agents(2). In this study we aimed to evaluate the Numune Score (NS)(2) which can predict the occurrence of cystobiliary fistulae in patients who have been treated with PAIR.

Material and Method
124 patients were retrospectively reviewed from medical records that have been treated with PAIR in our clinic between January 2014 and September 2018. Patients demographic features, classification of cysts (Gharby), prescence of bile, and parameters of NS; direct bilirubin levels, white blood cell counts, cyst diameter, alkaline phosphatase levels, were recorded. NS were calculated individually for patients and relationships between cystobiliary fistulae and NS were analyzed.

Results
15 patients have been excluded from the study due to insufficient data. There were 73 (67%) female and 36 (33%) male. Mean age was 46 (18-85). Cystobiliary fistulae have been detected in 20 (18.3%) patients. when NS have been compared with prescence of bile, the sensitivity, specificity and negative predictive value were 65%, 84.7%, and 91.4% respectively. ROC curve analysis showed significant statistical difference (AUC: 0.712, p= 0.003).

Conclusion: With high specificity rate and negative predictive value, NS can predict cystobiliary fistulae even in patients who were suitable for PAIR. This simple scoring system may lead clinicians to evaluate the biliary tree before intervention and prevent from complications especially in patients who have score ?2.

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Oral Presentation 11

EVALOUTION OF NATIVE AND MULTIEPITOPE RECOMBINANT (RecDipol) ANTIGENS IN DIAGNOSIS AND FOLLOW UP PATIENTS WITH CYSTIC ECHINOCOCCOSIS

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Background

Cystic echinococcosis is a zoonotic parazitic disease caused by metacestodes of *Echinoccoccus granulosus*(1). Surgery, Puncture, Aspiration, Injection, Re-aspiration(PAIR), chemotherapy and watch and wait are currently recommended as treatment options of CE (2). It has been reported that relapses in the form of newly developing cysts after surgery and medical therapy may seen between 2 and 25% of cases (3).

Early diagnosis of CE enables to effective medical treatment and decreases morbidity and mortality.In this context, relaps should be detected as soon as possible with follow up after treatment(4).

Objective

The aim of this study was to investigate the value of hydatid cyst fluid and multiepitope recombinant antigen (recDiPol) in diagnosis and follow-up of patients with CE.

Materials and Methods

A total of 31 sera were collected from 8 CE operated (surgery or PAIR) patients during a clinical follow-up period. For the each case, the time points were as follow: first serum sample was obtained before clinical intervention, then 3, 6, and 12 months after surgery, and once a year. Fourteen sera from patients with other parasitic diseases which are alveolar echinococcosis(2), fascioliasis(4), toxoplasmosis(1), ascariasis(1), teaniasis(1), trichinellosis(1), toxocariasis(1) and 3 mix infection(toxoplasmosis, ascariasis, trichuris, toxocariasis)(3), positive control and negative control sera were included. Sera were screened for the presence of *E. granulosus* IgG antibodies using in-house Enzyme-Linked Immunosorbent Assay (ELISA) and Westernblotting (WB). Hydatid fluid and recDiPol were used as antigen sources. Patients were also retrospectively reviewed for the anatomical location and number of cysts, cyst stage, and medical therapy.

Results

Eight patients (males and 6 females; mean age was 34, range 8-56 years) with clinically and radiologically CE diagnosed. Sequential serum samples (n= 31) were obtained from 8 CE patients (CE1= 3, CE2 = 1 and CE3b =3). Organ location of cysts are 5 Liver , 1 lung and 2 multiple location (liver+lung). Three patients out of 8 patients had no medical treatment before the operation. The cyst size varied in 3.5 x4.5-13x10 cm.

Total IgG antibody were detected in 6 patients before treatment (0 day) in ELISA with HF and the remaining two seronegative patients were seropositive in the following month.

The post-treatment evolution of IgG antibody levels in the ELISA showed that 5 patients out of 8 patients immunoglobulin levels increased during the first 3 months following surgery. Subsequently, in most patients antibody levels started to decrease progressively with time. Only one patient's antibody level remained high during in this follow-up period because of still having one active cyst in the liver.

All patients had cured or stable disease with no clinical or radiological evidence of recurrence or remaining cyst activity through a follow-up period and ELISA results supported this result by decreasing antibody levels over time.

In terms of cross reaction, there was no cross reaction with recDiPol with other parasitic infections, while cross reaction with 2 AE patients was observed with hydatid fluid by ELISA. The recombinant antigen showed better performance than HF antigen in the terms of specificity.

The immunoblot profiles of sera from 8 CE patients (31 sera) were qualitatively and quantitatively very heterogeneous within each patients. WB bands (HF: 8-12, 32-34 kDa, recDipol: 66 kDa) gradually faded in each follow-up patients. In this respect, WB appears to be compatible with ELISA results.

Conclusion

Relapses should be detected as soon as possible since early treatment of CE reduces mortality and morbidity. Nevertheless, immunodiagnosis and follow up of CE is still problematic and complicated. Therefore, the endpoint determination of the antibody level alone did not provide a sufficient prognostic value to decide for individual patients if further treatment needed to be added or treatment needed to be continued .Further post-treatment follow-up studies of human CE needs to be continued.

In our study, patient follow-up will be continued.

Recombinat antigen (recDiPol) of this research was produced in IRNASA/SALAMANCA and received funding from the European Community's FP7 under the grant agreement 602051 (Project HERACLES; http://www.heracles-fp7.eu/).

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SPONTANEOUSLY RUPTURED HYDATID CYST CASES : A SINGLE CENTER EXPERIENCE

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Objective

Hydatid cyst is a parasitary, zoonotic disease which is caused by the larva forms of the cestodes called echinococcus granulosus. Rupture is the most important complication of hydatid cysts. Emboli, anaphylactic shock or sudden death can occur when the cyst is ruptured. These complications make hydatid cysts important particularly in antemortem and post-mortem assessments in endemic regions. This study aims to examine the characteristics of ruptured hydatid cyst cases which do not result in death.

Material and Method

Based on the histopathological examination results between January 2010 and June 2013 (42 months), spontaneously ruptured cysts which are treated upon echinococcus granulosus diagnosis were examined. Based on histopathological examination results; age, sex, clinical findings of the cases who are treated upon being diagnosed with ruptured hydatid cyst and the characteristics such as the location, diameter of the hydatid cyst, cyst type and rupture type were examined retrospectively.

Result

In this study, 162 hydatid cyst cases were determined. The cyst was ruptured spontaneously in 16.7% (n=27) of the cases. When spontaneously ruptured hydatid cyst cases were examined; the age average of the cases was 18.6±12.8 and, 55.6% (n=15) was men, 44.4% (n=12) was women. 15 of them were located in the lung (left lung 8, right lung 7), 11 of them were livers and 1 of them was located in the left kidney. In our study, the average size of the ruptured cysts was 7.5 cm (sd:±3.3) (Lung: 8.2 cm (sd:±3.7), Liver: 6.7 cm (sd:±3.3)). It was determined that the cases mostly applied to the hospital with medical complaints such as abdominal pain, nausea and vomiting in hydatid cysts located in the liver; and coughing, chest pain and fever in lung located ruptured hydatid cysts.

Conclusion

According to our results, rupture is frequently spontaneous in hydatid cysts. Sudden abdominal pain, nausea and vomiting post trauma are symptoms associated with hydatid cyst rupture and severe allergic reactions are rarely seen.

Key words: Hydatid cyst; rupture; spontaneous

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SPLENIC HYDATID CYSTS: A SINGLE CENTER EXPERIENCE

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Objective

Hydatid cyst disease, which is endemically observed and an important health problem in our country, involves the spleen at a frequency ranking third following the liver and the lungs. In this study, we aimed to evaluate the efficacy and results of management in splenic hydatid cysts.

Materials and Methods

The demographic data, localization, diagnosis, treatment methods, and the length of postoperative hospital stay of patients with splenic hydatid cysts in a 10-year period were evaluated retrospectively.

Results

Twenty one cases were evaluated. Among these, 15 were females and six were males. Eleven had solitary splenic involvement, eight had involvement of both the spleen and the liver, and two had multiple organ involvement. Ten had undergone open splenectomy, one had undergone open distal splenectomy, and the remaining cases had undergone different laparoscopic surgical procedures. The patients had received albendazole treatment in the pre- and postoperative period. The clinical picture in splenic hydatid cysts, which is seen rarely, is usually asymptomatic. The diagnosis is established by ultrasonography and abdominal CT.

Conclusion

Successful results have been obtained by ultrasonography and CT-guided percutaneous cyst drainage and cavity irrigation using scolicidal agents in type I and II, and some of type III splenic hydatid cyst.Type III and IV hydatid cyst can be operated successfully by laparoscopic approach. The aim of surgical treatment should be to preserve the spleen.

ABDOMINAL CYSTIC ECHINOCOCCOSIS: A HOSPITAL BASED STUDY

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Objective

Hydatid cyst disease maintains its importance as a common health problem in our country. This disease is endemic in many regions of the world. In this study, we aimed to evaluate the efficacy and results of management in intraabdominal hydatid cysts.

Materials and Methods The demographic data, localization, diagnosis, treatment methods, and the length of postoperative hospital stay of patients with splenic hydatid cysts in a 10-year period were evaluated retrospectively.

Results

Seventeen cases were evaluated. Among these, 11 were females and six were males. Eight had pelvic three mesenteric and six peritoneal involvement. Five cases had involvement of the liver together with intrabdominal involvement. Two had multiple organ involvement including lung and liver. Patients with abdominal cysts presented primarily with abdominal pain or abdominal swelling. The patients had received albendazole treatment in the pre- and postoperative period. The diagnosis is established by ultrasonography and abdominal CT. For hydatid cysts in the omentum or in the peritoneal cavity complete cystectomy including the peri-cyst lining is done. The peri-cyst in peritoneal hydatids is extremely thin and not as vascular as seen in liver and spleen hydatids. Since 2012, we have changed our operation type selection to laparoscopic surgery. None of the patients had any recurrence or residual disease in the period of follow up.

Conclusion

Large cysts involving solid organs in the peritoneal cavity warrant prompt surgical intervention. Peritoneal hydatids are usually secondary hydatids due to rupture and dissemination. As our experience in laparoscopic surgery increased, we showed that intraabdominal hydatid cyst treatment could be performed laparoscopically as in the open surgical principles.

LIVER HYDATID CYSTS: OUR EXPERIENCES IN A TERTIARY REFERRAL CENTRE

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Objective

Liver hydatid cysts are also quite common in the Turkey. The aim of this study was to present the surgical and clinics of patients for the treatment of Liver hydatid cysts.

Materials and methods:

The data of liver hydatid cysts operated on between 2014 and 2018 were retrospectively compared in respect of clinicopathological and operative results, morbidity.

Results

A total of 23 patients were included in the study. After retrospective evaluation of the database, 56.5% were female and the average age of the whole group was 37 (±15) years. Preoperative imaging and biochemical tests revealed no involvement with biliary tract. Four patients (17.3%) were preoperatively negative for IHA. According to the Gharbi classification, 17 patients (73.9%) were found to have gharbi 2-3, 4 (17.3%) patients were gharbi 4 and 2 (8.6) patients were gharbi 5. The mean cyst diameter was 8 cm (± 2.7). 16 patients underwent partial cystectomy, 2 patients underwent total cystectomy, 2 patients underwent laparoscopic partial cystectomy, and 2 patients underwent laparoscopic pericystectomy. There was one patient superficial infection There was no postoperative mortality. The long-term follow-up period, was determined as, mean 24.9 (±11.6) months in the liver hydatid cysts, there was any recurrence in follow-up.

Conclusion

Surgical treatment of liver hydatid cyst is minimal in morbidity and mortality. Also surgery first option is an use Treatment.

PRIMARY CYST HYDATIC IN INTERPECTORAL AREA

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Objective

Atypical and long-term hydatid cysts have been detected and we wanted to share our experiences from the case of surgery.

Materials Methods

Our patient is 81 years old, male, retired officer. The patient presented with complaints of swelling of the anterior chest wall in February 2011. He says that this swelling has been about 50 years ago, and that it has reached its current size over time. He thinks that he has done wrestling during his youth and that he has been hit with a lot of impact on his chest during the competitions. He said he was uncomfortable with swelling. Physical examination revealed a soft mass of 15x15x10 cm between the pectoral muscles on the right anterior chest wall. Magnetic resonance imaging of the patient indicated that there was a multicystic mass with thin septa and that pre-diagnosis could be hydatid cyst, abscess or cystic neoplasia. The patient was leukopenic (WBC: 2,55), neutropenic (1,17), thrombocytopenic (110), diabetic.

Results

The patient was taken to the operation by performing preoperative investigations and consultations. The mass was totally excised under general anesthesia. On postoperative day 2, the patient was discharged with full recovery. The patient was given albendazole treatment for 8 weeks after the operation. The pathological diagnosis of the removed mass was reported as hydatid cyst. When the patient was previously diagnosed as having hydatid cyst, he stated that he did not get such a diagnosis. In other regions, no secondary focus was detected in the scans performed for hydatid cyst. In its present state, the disease was defined as the primary hydatid cyst in the interpectoral space. The most recent follow-up was performed in October 2018. No local recurrence or other secondary cystic focus was detected during the examination and examination. We decided to publish because of the primary localization of atypical primary site and a long history of disease as 50 years.

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LIVER HYDATID CYST; THE HITIT UNIVERSITY EXPERIENCE

Murathan ERKENT, Ibrahim Tayfun SAHINER, Murat KENDİRCİ, Mesut BALA, Ramazan TOPÇU, Murat Baki YILDIRIM, Murat Bulut ÖZKAN, Settar BOSTANOĞLU, Mete DOLAPÇI

Hitit University, Faculty of Medicine, Department of General Surgery CORUM

Echinococcosis is an endemic disease of Asia, Africa, South America and Mediterranean countries. It is a quite common zoonoses in humans and animals especially in the less developed countries and populations in our country's rural areas. Its agent is Echinococcus granulosus and alveolaris. It is most commonly seen in the liver and lungs. Infecting, replace, and several other complications are observed when the proper treatment is not applied and the proper follow-up is not performed after the treatment.

Objective

The hydatic cyst experience of the last 5 years in the General Surgery Clinic in the Hitit University Medical Faculty was shared in this study.

Material and Methods

The patients diagnosed with hydatid cyst who applied to the clinic between the years of 2013-2018 were reviewed retrospectively. Demographic characteristics of the patients, symptoms at the time of the application, location of the cyst, diagnosis, stage and treatment method, complication, and relapse were evaluated.

Results

A total of 46 patients with hydatid Cyst was followed-up and treated between the dates of September January 2013 and 2018 There were 27(58,6%) female patients and 19(41.3%) male patients. The average age of the patients was found as 55.3 (23-74 years). The review of the application symptoms of the patients showed 95% of abdominal pain, and 5% coughing. In terms of the location of the disease; 1 patient had isolated spleen (2%), 3 patients had left lobe of lungs and liver right lobe (7%), 5 patients had left lobe (11%), 26 patients had liver right lobe (56%), and 3 patients had isolated intra-abdominal involvement (7%). Multiple segment involvement (17%) was observed in the liver in 8 patients. Involvement was observed the most in segments 6, and 7. For two patients it was located at the segment 4A-4B junction. It was located in the caudate lobe in 1 patient. Cyst perforation was performed under emergency conditions in two of the patients diagnosed with intra-abdominal cysts. When the cysts were examined according to the Gharbi classification; 11% (n: 5) type 1, 26% (n:12)

Type 2, 30% (n:14) Type 3, and 33% (n:15) Type 4 hydatid cyst was found. The patient with isolated spleen involvement (2%) was applied with splenectomy, 4 patients were applied with PAIR (9%), 4 patients underwent laparoscopic cystotomy and drainage 9(%), 6 patients (13%) were applied with cystectomy, 2 (4%) patients were applied with total cystectomy due to perforation, and other 29 patients (63%) were applied with cystectomy drainage + omentopexy. A total of 4 patients developed bile fistula and was taken under control with ERCP (%8.6). All of the patients with fistula had multiple cysts lobes and they were located on both lobes. The mean total cyst size in 4 patients with fistula was 4.7 cm (1-10 cm). The mean of the bigger cysts considered to be related to the biliary tract were calculated as 9.75 of the 5 patients. No mortality occurred in any of the patients. The mean cyst size was 9 cm (+ - 2.5 SD). All the patients were routinely given albendazole treatment preoperatively 1 month and postoperatively 6 months. A total of 3 patients (6.5%) were found to relapse.

Conclusion

It would be appropriate to evaluate the patients who applied the clinic with ambiguous abdominal complaints and considered suspicious in the anamnesis in terms of liver and other intra-abdominal organ involvement in regions considered endemic for hydatid cyst such as our contry. The primer treatment in hydatid cyst patints is inteventional and this covers a spectrum of percutaneous drainage, laparoscopic-open radical surgery. The lesion should be evaluated radiologically and staged prior to any intervention for hydatid cyst disease. Then, specific treatment planning for each patient should be started. Relapse rates can be reduced with albendazole treatment pre & post surgery.

Oral Presentation 18

COMPARISON OF SERUM GLUTATHIONE VALUES IN THOSE WITH HYDATID CYST AND *TOXOPLASMA GONDII* SEROPOSITIVITY AND *ENTAMOEBA COLI* AND *ENTERIOBUS VERMICULARIS* POSITIVITY

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Objective

Glutathione (GSH) is a tripeptide with high intracellular concentration comprising glutamic acid, cysteine and glycine amino acids. Reactive species of GSH protect against the detoxification of conjugation and lipid peroxidation products and the harmful effects of oxidants sourced endogenously and exogenously in cells. In this study, the aim was to compare serum GSH levels between parasite infections with experimental and control groups.

Materials and Methods

Serum GSH levels in patients positive for parasites and a control group were examined with the Fairbanks and Klee method. For assessment of data one-way ANOVA was used. The normality and variance homogeneity assumptions for variance analysis were checked with the Levene and Kolmogorov-Smirnov tests, respectively. The Tukey multiple comparison test was used to determine different means. For statistical tests and interpretation of results, significance level was taken as 5%. All calculations were performed with the SPSS v. 25 (IBM Inc., Chicago, IL, USA) statistical program. The results of variance analysis found the differences between GSH amounts (μmol/L) within the groups were statistically significant ($p<0.001$).

Results

GSH (μmol/L) activity was found to be significantly high in the control group compared to the other groups ($p<0.05$). The hydatid cyst group, with nearly 50% lower GSH (μmol/L) amounts compared to the control group, was determined to have significantly high means compared to the other parasite groups ($p<0.05$). There was no significant difference between the *Entamoeba coli* and *Enterobius vermicularis* groups with lowest means ($p>0.05$), and the serum GSH (μmol/L) activity in both groups was significantly low compared to the *Toxoplasma gondii* group ($p<0.05$).

Conclusion

The reduction in serum GSH levels in parasite infections is considered to be due to the increase in use to eliminate the harmful effects of peroxidation by the body against oxidative stress.

Key words: *Entamoeba coli*, *Enterobius vermicularis, Echinococcus granulosus, Toxoplasma gondii*, glutathione

LAPAROSCOPIC HYDATID CYST EXPERIENCES

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Objective

Hydatid cyst is an endemic disease in our country. The disease is caused by parasites called Echinococcus Granulosus. It is most commonly localized in the liver. Surgical treatment can be performed in selected cases. Today, as in all other open surgical techniques, laparoscopic method is successfully used in hydatid cyst disease. Laparoscopic approach is becoming increasingly popular in hydatid cyst operations because of its advantages such as low morbidity, short hospital stay, early return to work and better cosmetic results.

Material And Method

10 patients who underwent laparoscopic surgery with hydatid cyst in our clinic between 2010-2018 were evaluated.

Results

7 of the patients included in the study were female and 3 were male. The average age was 45.3 (22-68). In 8 patients, hydatid cyst was in the right lobe and in 2 patients it was in the left lobe. The operations were performed with 3 trocars.While Infraumblical 10 mm optical trocar used , in the right and left upper quadrants 5 mm trocars were used. After decompression of the omental adhesions, gauze dampened with hypertonic saline was spread around the cyst. The cyst content was aspirated by the Veress needle. Hypertonic saline was administered into the cyst. Cystotomy was performed after the hypertonic solution was aspirated. The mean duration of operation was 105 min (82-128). No complication was seen postoperatively in our patients. The drains were pulled on the average 3rd day. **Conclusion**

Laparoscopic treatment of hydatid cyst disease is a safe and effective approach to selected patients. Increased surgical experience will allow more widespread implementation of this procedure contributing to patient comfort.

Oral Presentation 20

A RARE CAUSE OF ABDOMINAL PAIN; PARADUODENAL GIANT HYDATID CYST

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Hitit University, Faculty of Medicine, Department of General Surgery CORUM

Objective

Hydatid cyst is one of the oldest known diseases. It is a zoonotic disease caused by *Echinococcus granulosus*. It mainly involves the liver, but it can also be located in other parts of the body. It was first described by Hartman in 1695. It is also common in our country although the disease is seen in less developed countries today. It is seen with 14% of incidence in Turkey. It may be located as extrahepatic in the lung, mediastinum, pleura, pericardium, skeletal muscle, spleen, pancreas, retroperitoneum, pelvis, mesocolon, gallbladder, and surrenal gland. It is rarely seen in the literature that it is located in the paraduodenal area.

Material and Method

We aimed to present a giant cyst hydatid lesion located paraduodenal in retroperitoneum in this study. A 65-year-old male patient was admitted to the emergency department with intermittent abdominal pain, but also with increase in severity of the pain, and nausea in the last month. There was no pathology detected in laboratory values except for a minimal rise in the liver enzymes. Abdominal tomography was performed. Smooth countered hypodense areas of 35x30 mm size on the liver right, caudate and the biggest one on the left lobe was detected and evaluated as simple cyst. However, there was a mass having slightly lobule contour hypodense cystic lesion of approximately 110x95 mm size located in the celiac artery medial neighboring the posterior head of the pancreas causing springiness in the vein and right renal artery. Malignant transformation was suspected primarily. MRI was performed upon these findings. MRI revealed areas with simple cysts in multiple segments of the liver. Preoperative hydatid cysts (IHA) results were calculated as 1/1280. The patient was discussed at the surgical council with these findings and it was decided to undergo surgical exploration. During exploration, a 12x5 cm of giant cystic mass was found which reached the posterior of the pancreas head after the duodenum coherence, pushing the inferior of the vena cava and medial to the aorta, located in the medial of the celiac artery and causing the right renal artery and vein to spring. The cyst cavity was emptied by unroofing. With hypertonic saline solution (3% sodium chloride solution) In addition, unroofing was performed to the 4x4 cm lesion on the segment 3 junction in the left liver lobe and 1 cm of lesions in the segment 6 and 8.

Results

The patient who started oral intake and did not develop bile fistula had the drain removed on the 6th postoperative day and was discharged from the hospital. The patient was treated with andazole before and after the surgery. The pathology results showed that the sample taken from the liver and the paraduodenal area are consistent with the cyst hydatid. No relapse was observed in the patient's follow-up visits 3 months later.

Conclusion

Hydatid cyst disease can also be seen in other organs of the body other than the liver. The diagnosis is difficult because of the absence of a typical clinic. The diagnosis is mainly based on serological and radiological examinations. One of the treatment options of the disease is the tapping of the cyst content by surgical method. A case of hydatid cyst confined to paraduodenal area which is rarely seen in retroperitoneal area is discussed in the literature.

Poster Presentations

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Poster Presentation 1

PERSISTENCE OF ECHINOCOCCUS GRANULOSUS INFECTIONS IN SHEEP IN THE FALKLAND ISLANDS AFTER PROLONGED INTENSIVE CONTROL.

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In the early 1940s, Cystic Echinococcosis was highly endemic in the Falkland Islands in both livestock and people. This prompted the instigation of an intensive control scheme in the mid-1970s, comprised of regular dosing of domestic dogs with the anthelmintic praziquantel and education of local people about safe disposal of potentially infected offal. This scheme has remained in place to the current day, and is generally considered to be a successful programme. The prevalence of infection in sheep has reduced from >50% in the 1950s to less than 1 % now and there has not been a case of human hydatid disease for more than 20 years. Control is currently based on adequate disposal of sheep livers and lungs on farms, which operate home slaughter, slaughterhouse inspection of offal, and compulsory 5 weekly dosing of all domestic dogs on the islands with praziquantel. In spite of these control procedures, there is concern that a small number of sheep have hydatid cysts at slaughter (0.02% in 2014) and occurring each year subsequently suggesting that transmission is still occurring. This is also supported by the observation that sheep continue to be infected at higher levels with the (non-zoonotic) cestode Taenia hydatigena, also transmitted by dogs, In 2010, all dogs on the Falkland Islands were tested by CoproAntigen, resulting in 6 dogs (1%) testing positive. A new study has been launched to gain an understanding of the factors which may contribute to the persistence of dog transmitted, taeniid infections in sheep where there is intensive use of praziquantel to worm dogs. Areas of investigation are: 1. Reassessing the infection status of all dogs on the islands using Copro ELISA and CoproPCR 2. Evaluation of farming practice in relation to disposal of offal. 3. Evaluation of procedures and processes involved in administering praziquantel to dogs including measurement of drug uptake. 4. Investigating the possible role of other carnivorous definitive hosts occurring on the islands, eg feral cats or Patagonian Foxes (Dusicyon griseus griseus), 5. Investigating the longevity of taeniid egg survival. This poster will provide initial data on the above aspects and will hypothesise on theoretical explanations of continued transmission.

ECHINOCCOCOSIS IN PLEVEN REGION, BULGARIA - SWOT ANALYSIS

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Objectives

Human echinococcosis is a zoonotic disease (a disease that is transmitted to humans from animals) that is caused by parasites, namely tapeworms of the genus Echinococcus. The objective of this study is to analyze the current state of Echinococcosis in the Pleven region of Bulgaria and to discuss the possibilities for controlling the disease.

Materials and Methods

We used the principles of SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis to discuss the control measures of the Echinococcosis Disease in Pleven Region, Bulgaria.

Results

Echinococcosis is subject to mandatory registration and reporting in Bulgaria according to Ordinance ? 21 from 18 July 2005. Diagnosis of the disease is performed by qualified specialists. The regional controlling authority is the Regional Health Inspection together with veterinary specialists and in accordance with the Law on Veterinary Activities and the Animal Protection Law. The incidence of Echinoccocosis in the Pleven region for the past 20 years range between 5,27-3,13 per 100 000 persons randomly found during a doctor's visit. The disease affects mainly rural population in age groups 20-29 and 60-69 years old. With regard to newly discovered cases, treatment and dispensary monitoring are applied. It is well known that the dog plays an important role in the zoonotic cycle of transmission of Echinoccocus granulosus, but the control results for the dog as a reservoir are unsatisfactory. The region has stray dogs as well as unregistered pets. The medical and social problems resulting from these facts for society require wider educational activities among the population and effective control in the implementation of the normative documents adopted in the country.

Conclusion

Considering the current status of incidence of Echinoccocosis in Pleven region effective control of the disease requires collaboration between clinical specialists, control institutions, non-goverment organizations.

EVALUATION OF THE IMMUNOCHROMATOGRAPHIC TEST FOR DIAGNOSIS OF CYSTIC ECHINOCOCCOSIS

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Objectives

Diagnosis of cystic echinococcosis (CE) is based on the identification of the cyst(s) by imaging using immunodiagnostic tests as complementary tools in clinical settings. In this study we evaluated immunochromatographic test (ICT) (VIRapid HYDATIDOSIS) for total *Echinococcus granulosus* (*E. granulosus*) antibodies in comparison with enzyme-linked immunosorbent assay (ELISA).

Materials and Methods

A total of 48 patients with surgically and pathologically confirmed CE were included in the study. The control group consisted of patients tested negative for CE with ELISA (ELISA kit, DRG, Germany). ELISA-positive serum samples of surgically and pathologically confirmed CE patients, and ELISA-negative samples from the control subjects were studied by ICT, and the performances of ICT and ELISA were compared.

Results

In CE group, only one (2%) of the 48 samples was negative and 47 (98%) were positive with ICT. All samples (100%) of the control group were also seronegative with ICT.

Conclusion

ICT and ELISA had similar performance for the detection of specific antibodies to *E. granulosus*, and ICT had a high specificity and sensitivity. We thing that ICT can be used in routine clinical practice as a screening tool especially in rural areas, because this method does not require elaborate instrumentation and special storage conditions.

Key Words: Immunochromatographic Test, ELISA, Cystic Echinococcosis, Diagnosis

Poster Presentation 4

FUTURE IMPORTANCE OF THE PARASITAL STEM CELL AND 3-D MODEL RESEARCH

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Objective

Human hydatid disease or cystic echinococcosis is a worldwide parasitic disease (1). Cystic echinococcosis (CE) caused by *Echinococcus granulosus* and alveolar echinococcosis (AE) caused by *Echinococcus multilocularis.* And metacestode larval stages continue to be a common problem in health care settings (1,2,3,4,5). It is a life-threatening disease and it is very difficult to treat. As a therapeutic approach, chemotherapy is limited to the use of benzimidazoles that stop parasite development but do not kill the parasites, and new therapeutic alternatives are needed to compensate for this therapeutic deficit. Since drug options are limited to benzimidazoles albendazole and single chemical mebendazole, the latest applications of genomic science drug discovery and small inhibitor molecules pointing to clinical medicine, in particular key metabolic enzymes or signaling pathways are important (5,6,7).

Materials and Methods

Humans are intermediate hosts which infected by oral uptake oncosphere larvae. After sexual multiplication, nearly unrestricted growth of the metacestode within host organs happen (2). In vitro hepatocyte-based cultivation system was developed for the metacestode stage of *E. multilocularis* which caused AE. But hepatocytes in traditional cultures of two dimensions lose their phenotypic and functional properties rapidly after about seven days. This condition prevents the long-term in vitro studies of *E. multilocularis* larvae. Because their larvae need several months for development. For this reason, a three-dimensional (3D) hepatic model has been developed. With this model hepatocyte functions can be protected and *E. multilocularis* larvae can develop rapidly. This new model provides a new basis for the in-depth analysis of the *E. multilocularis* developmental studies and host-to-parasite interaction in AE (3).

Results

Recent studies have shown that *E. multilocularis* employs pluripotent stem cells which called germinative cells. Thus, germinative cells are an important cell type that mediates proliferation of *E. multilocularis*. *E. granulosus* should probably be responsible for the recurrence of parasites in the host organs as well as in the cessation of chemotherapy. It has also been shown in studies that the geriminative cells may be less susceptible to chemotherapy (2).

Conclusion

In this study, interdisciplinary research and applications in the field of cystic echinococcosis will be discussed in the light of the latest scientific technological developments.

Keywords:*Echinococcus granulosus*, benzimidazoles, germinative cells, pluripotent stem cells, 3D

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Poster Presentation 5

UNDERSTANDING THE GENOME AND METABOLIC PATHWAYS OF *ECHINOCOCCUS GRANULOSUS* FOR DIAGNOSIS AND TREATMENT OF HYDATID DISEASE

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Objective

Cystic echinococcosis is a hydatid disease and caused by the tapeworm *Echinococcus granulosus*. The disease is a neglected tropical disease which is responsible for morbidity and mortality in millions of humans. It is difficult to diagnose, treat, control and it causes major economic losses in humans and the livestock industry worldwide (1,2,3).

Materials and Methods

Tapeworms have specific detoxification pathways and metabolism. By means of these structures they can be based on nutrients scavenged from their hosts, and species-specific expansions of non-canonical heat shock proteins and known antigens families (4). The genome and transcriptome of *E.granulosus* are very appropriate for post-genomic research (2). Genomes provide a rich resource that facilitates the development of interventions and effective treatments needed for parasitic maturation and echinococcosis control (1,2,4).

Results

According to the draft of genomic sequence studies of *E.granulosus*, total genome size was announced 151,6 Mb and gene number was announced 11,325(1,2). Metabolic pathways and bile acid regulation of *E.granulosus* was also schematically presented (1). Investigations on the genome and metabolic pathways of *E.granulosus*, which negatively affect the society, can be used to develop existing control methods and drugs, and to identify new potential drug targets (1,2,4).

Conclusion

Molecular mechanism and physiology of *E.granulosus* can be understood by genome and transcriptome data and its pathogenesis can be illuminated. Existing drugs can be made more efficient, thus eliminating existing challenges in treatment and control. By means of all this,

new health interventions can be developed against hydatid disease (1,2). In this poster review, we aimed to investigate how the elucidation of the *E.granulosus* genome and its metabolitic pathways can contribute to the diagnosis and treatment of hydatid disease.

Keywords: *Echinococcus granulosus*, genome, metabolic pathway, transcriptome

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Poster Presentation 6

BIOINFORMATICS ANALYSIS OF *ECHINOCOCCUS GRANULOSUS* FABP1 VARIANTS

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Objective

Hydatid disease is an important parasitic disease caused by *Echinococcus* species. Caused by *Echinococcusgranulosus* that Cystic Echinococcosiscould leads to life-threatening clinical symptoms in humans.*E.granulosus* has two different lipid-binding protein groups These parasites have an important lipids in the life cycle. The main components of cell membranes and energy sources that lipids are heterogeneous molecules that have important functions in intracellular and extracellular signaling as well as cell structure and metabolism. They are also involved in the regulation of enzymes, cell surface recognition and cell interaction, gene expression / regulation Fatty-acid-binding proteins (FABP's) can be collect and accumulate their ligands specifically, interact directly with the cellular components, a role in cell growth pathways, proliferation, gene expression regulation. The study by Jakobsson and his team was clarified X-Ray structure of EgFABP1 in 1.6 Å resolution and then understand to similar to the "β-barrel" structure of vertebrate FABPs. EgFABP1 has 134 residue. EgFABP1 protein, which has 107th amino acids in the binding region. Researchers reported EgFABP1's 4 different variants to date in molecular genetic studies. These; G6V, T128N and A82T. Structural bioinformatics, which are protein structure studies, are one of the sub-branches of bioinformatics and its aim is to predict, develop and define molecular structures. Should be evaluated physico-chemical properties of proteins's amino acids for to understand the functional diversity of proteins. Physico-chemical properties of proteins and structure analysis contributes to understanding of the functions of proteins, development of experimental studies, solution of disease's metabolic/metabolism, functional calculations of protein, protein function estimations and drug development studies.

Materials and Methods

In this study, homology models of EgFABP1's variants generated by Swiss Model. The sequence of the FABP1 was obtained from the UniProtKB database (code: Q02970) and edited sequence of FABP1's variants. Three-dimensional structure in pdb format has been obtained by Swiss model portal for using sequencesphysico-chemical properties of protein variants analyzed using the ExPASy portal-ProtParam. Then obtained models of FABP1 variants visualized as ribbon and hydrofobic surface using by UCSF Chimera (1.13). The physicochemical properties of FABP1 variants were analyzed using ExPASy ProtParam. Amino acid count, molecular weight, theoretical pI value, percentage composition of amino acids, total number of negatively charged residues, total number of positively charged residues, atomic composition, total number of atoms, molar extinction coefficient, aliphatic index and hydropathy average of each model were calculated for using in the physico-chemical properties analysis.

Results

According to analysis results of modeling, conformational change is in a small amount or not. Varied regions of FABP1 models matched and visualized on wild-type variant as ribbon. These regions visualized as atomic and it is observed that atomic change is of less than 0.01 Å. All variants have hydrophilic surface structure. According to the physico-chemical analysis study all of variants total number of negatively charged residues is 22 aminoacids, total number of positively charged residues is 23 aminoacids, theoretical pI value is 7.70. According to the results of physical-chemical analysis varying features are; total number of atoms, molecular weigth, aliphatic index and hydropathy average(GRAVY). According to the results of the physico-chemical analysis, aliphatic indexes of each variant are very close, so they cannot alter the structure and physical properties of proteins. When hydropathy index complies with modeling results, small hydrophobic changes were observed on the model surface. All variants have hydrophilic surface structure. Considering the change in hydrophobicity, the most significant change was observed in G6V variant.

Conclusion

FABP1 variants do not alter the protein structure, it is believed that the absence of change suggests that these variants do not make any difference in physiological processes. It's thought that polar uncharged amino acid to nonpolar amino acid variation might be the reason of more different at difference of hidrofobicity of G6V variant among all models.This study is the first study to compare and modelling the EgFABP1 variants so contribute to the literature.

KeyWords: Cystic echinococcosis, FABP1, *Echinococcusgranulosus,* Bioinformatics, Homology Modelling,Physico-chemical analysis, Structure Analysis

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Poster Presentation 7

RECENT APPLICATIONS FOR THE DIAGNOSIS OF ECHINOCCUS GRANULOSUS: A REVIEW FOR NEW APPROACHES

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Objective

Cystic echinococcosis which is a chronic zoonotic disease affects humans and domestic animals (1). *Echinococcus granulosus* is the major zoonosis for cystic echinococcosis and there is a growing evidence that they are excellent models for studying host-parasite cross-talk between two mammalian hosts. It is important to understand the biology of parasite in order to enlight the mechanisms involved in the progress how the parasite causes a chronic disease. Up to now, different genotypes of *E. granulosus* have been identified by using molecular techiques (sequencing, phylogenetic analysis) from human, sheep, camel, etc (2,3,4). But now the molecular approaches are not restricted on DNA levels but also on RNA levels. Non-coding RNAs which are important gene regulators on post-transcriptional levels became hot topics for analyzing the key mechanisms of *E. granulosus*. Despite the fact that *E. granulosus* has a complex life-cycle involving different development stages, the mechanisms underlying in this development also including the involvement of miRNAs, remain unknown. In order to enlight these mechanisms high throughput approaches such as Next Generation Sequencing (NGS) step ahead (5,6,7).

Extra cellular vesicles (EVs) that are released by different cell types have the membranous origin They are mainly found in specific vesicles known as exosomes. EVs including exosomes are able to carry developmental signaling proteins which coordinate growth and establishment of several parasites and include proteins, carbohydrates, lipids, microRNAs and other small RNAs (8,9).

Materials and Metods

Hydatid cysts and protoscoleces (PSC) are used for molecular approaches. For DNA sequencing, DNA is extracted from cysts further PCR amplicons are prepared, purified and sequenced by genetic analyzer.

For miRNA analysis, PSCs are prepared, total RNA is isolated, small RNA library is generated and sequenced by using NGS platform.

In order to identify exosomal cargo content, EVs are isolated from hydatid cyst fluid (HCF), SDS-PAGE is used for quantification and visualization of proteins in the exosomal fraction, RNA-seq is used to identify transciptome profilling of exosomal RNA.

Results

Parkinson et al. (2012)used*E. granulosus* as a model to study the molecular basis of the host-parasite cross-talk during cestode infections and provided data for the expression of genes involved in important aspects of *E. granulosus* biology, such as metabolism and the synthesis of key parasite structures. Bai et al. (2014) sequenced adult, protoscolex and cyst membrane of *E. granulosus*and found 43 mature miRNAs and 23 miRNA stars. Siles-Lucas et al.(2017) demonstrated that *E. granulosus* cysts produce and release exosomes into the HCF.

Conclusion

Using high throughput analysis methodologies can help to underly the mechanism of interaction between *E. granulosus* and its hosts, providing information that can be used to develop new therapeutic targets for the diagnosis of cystic echinococcosis.

Keywords: *E. granulosus*, non-coding RNA, exosomes

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Poster Presentation 8

COULD THE HYDATID CYSTCONTAIN A PREVENTIVE OR THERAPEUTIC MECHANISM FOR CANCER?

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Objective

Human cystic echinococcosis (CE) is a zoonotic infection caused by the larval stages of *Echinococcus granulosus* (1,2).Cysts act as a space occupying lesion and exert pressure on adjacent tissues (3). *E. granulosus* metacestodes exhibit tumor-like properties with seemingly unlimited growth and proliferation potential, modulating immune response, and metastasis (27).Secondary infection in humans is an important medical problem that arises after protoscolexspread after accidental rupture of the cyst, avoidance of host immune response and their transformation into new cysts (5). In humans, many infectious agents (e.g., bacteria, viruses, pathogens and parasites) are thought to cause cancer. Carcinogenesis associated with helminth infections is a complex process that may involve many different mechanisms, including chronic inflammation (6).To get rid of immune reactions, cancer cells can use strategies similar to those of infectious organisms, especially parasites and viruses (7).In addition, the ability of various infective agents to suppress cancer development is well documented in both human and experimental animal models (8,9).

In this view, the examination of the current literature suggests that some *Echinococcus* antigens may cause adaptive immunity to cancer (10). In this review, current findings about the effect of *E. granulosus*induced hydatid cyst on cancer development will be briefly reviewed and the usability of hydatid cyst for cancer treatment and future approaches will be emphasized.

Materials and Methods

Many in-vivo and in-vitro methodologies have been used in the studies. Some of those can be counted as Cell Culture Methods, Hydatid Cyst Fluid Extraction, Flow Cytometry, Histopathological Evaluation, Expression and Sequence Analysis, Two-Dimensional Electrophoresis and Western Blotting also in-vitro Mice Tumors and Immunization Studies (2,3,11).

Results

In the literature, immunological cross-reaction between hydatid cystic and noninfectious diseases has been reported (12).In addition, the anti-cancer effect of hydatid cyst has been shown in different studies (13,14,15). There is evidence to suggest that some *Echinococcus* antigens are capable of inducing antibody-mediated immunity that can induce non-specific immunity to certain types of cancer. On the other hand, EgKI-1 secreted by *E. granulosus* shows direct anti-cancer effects (10).

There are conflicting reports that *E. granulosus* can reduce cancer growth (16,17). In a large retrospective study in Turkey, a significantly lower prevalence of cancer has been reported in patients with hydatid disease (16).On the contrary, a pilot retrospective study in Cyprus showed that echinococcosis could increase the risk of cancer in patients (18).There is more evidence to support the concept that *E. granulosus* reduces cancer growth. This may be due to a direct effect or indirectly with the development of immunity to common antigens associated with cancer and echinococcosis (10).

In an early study, antigenic similarity between pulmonary carcinoma and hydatid cyst fluid has been reported (19). Thus, common antigens and some types of tumors found in *E. granulosus* were thought to modulate host immune responses that induced anticancer activity (20).Hydatid cyst fluid antigens have been reported to have higher immunological cross-reactivity with sera from cancer patients than from sera obtained from healthy individuals (21).In contrast to sera from healthy specimens, the sera of patients with hydatid disease have a cytotoxic effect that provides additional evidence of antibody-mediated immunity against cancer on human lung small cell carcinoma cells (22). In addition, it has been shown that 40% of mice vaccinated with hydatid cyst fluid induce tumor regression in the colon cancer model and also generate an adaptive immune response against tumor challenge (11). In an experimental breast cancer study using rats, 20 days after echinococcosis infection, the animals reported less tumor growth compared to uninfected rats (23).Modulation of the immune response is thought to be an important strategy for cancer prevention in chronically infected hosts with *E. granulosus* modulating the long-term response of the host immune system (5).

On the other hand, the coexistence of cancer (e.g. hepatocellular carcinoma, myeloid leukemia, ovarian tumors and gastric carcinoma) and hydatid disease has been reported by several groups (24,25,26).In contrast, immunodeficiencies and immunosuppressive therapies may support the recurrence of echinococcosis (27,28,29).Alternatively, it has been suggested that *E. granulosus* infection may have a protective effect against cancer development (16).This assumption is based on antigenic similarities between *E. granulosus* and some types of cancers and observations on the rarity of incisional liver tumors in patients operated for hydatid cysts (16,30,31).The presence of *E. granulosus* infection and the coexistence of breast tumors increased the cancer metastasis in the liver (17).

Conclusion

The anti-cancer effect of hydatid cyst has been demonstrated in cell culture assays and also in animal model studies or in the human population (15,16,32,33,34).However, the mechanism of this effect is still not clarified (3). In general, these studies suggest that some *E. granulosus* antigens may induce memory cell formation to attack cancer-related antigens (18).Therefore, it carries hope as a potential treatment against many types of cancer. In future studies to identify additional proteins secreted by *E. granulosus* for use in anti-cancer treatment are great importance (10).

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EVALUATION OF AGENTS USING FOR INHIBITION ON ACTIVITY OF PROTOSCOLECES

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Objective: Cystic echinococcosis is larval stage of *Echinococcus granulosus.* The protoscoleces develop in various organs of intermediate hosts (human and herbivore animals). Numerous scolicidal chemical/natural products are investigate for inactivation of hydatid cyst contents. The hypertonic salt is used commonly to kill protoscoleces, however, it has some side effects (1). In this context, we aimed to evaluate new agents in articles which is published at last years.

Material and method: In this study, we searched using the keywords “scolicidal agents, cystic echinococcosis, and anti-hydatid” in PubMed, Google Scholar and Web of Science databases. The research covered a systematic literature search which includes scolicidal agents inhibit protoscoleces of *Echinococcus granulosus* that published in 2017 and 2018. The data were entered in Microsoft Excel and performed a table which includes the name of agents, concentration and exposure time.

Results: Total 12 different agents were found in papers which were published in these two years. Ten agents of them were any kind of plants (*Nectaroscordum koelzi* (2), *Veronica persica* (3), *Quercus infectoria* (4), *Zataria multiflora* (5), *Bunium persicum* (6), *Cucurbita maxima* (7), *Pistacia khinjuk* (8), *Cinnamomum zeylanicum* (9), *Curcuma longa* (10), *Zingiber officinale* (10), two of them were Nano particles (Gold). The concentration range and exposure time of agents vary between 250µl/mL- 100 mg/mL and 5 min.- 120 min. respectively. According to table, *N.koelzi*, *Z.multiflora*, *B. persicum*, *P. khinjuk*, *C. zeylanicum* have lethal scolicidal activity (100% death of protoscoleces) in concentration of 500 mg/mL, 2 mg/mL, 15 mg/mL, 100 mg/mL, 25 mg/mL, at 10 min.

Conclusion: In this study, we evaluate the new twelve agents to find out more effective on protoscoleces and to find a candidate which has 100% scolicidal activity in minimum concentration and minimum time. However, all studies were not under same conditions, and they show results in only 10 min. In this context we evaluate their lethal effect. In addition, we considered these agents should be investigated in animal models to evaluate the side effects of them.

Keywords: *Echinococcus granulosus*, scolicidal agents, protoscoleces.

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