Cystic Echinococcosis - CURRENT SCENARIO

Cystic echinococcosis (CE), one of the most widespread helminthic zoonoses, is a chronic disease caused by infection with the larval stage of the tapeworm *Echinococcus granulosus* complex. In endemic regions, human incidence rates for CE can be higher than 50 per 100,000 person-years and global prevalence is estimated at **2-3 million cases** with **200,000 new cases** diagnosed **annually**. This data represents just the **tip of the iceberg.** The **invisible portion** includes health, social and economic consequences for those affected by CE. In fact, clinically diagnosed cases represent only a small proportion of the total number of infected people (i.e. those that receive medical attention at the hospital level) and do not reflect the true incidence and prevalence of CE. Disability-adjusted life years (DALYs) and monetary losses resulting from human CE have been calculated at the global level assuming substantial under-reporting. The estimated **global human burden of CE** is at least **1 million DALYs,** or or an annual loss of **US$ 3 billion** (cost for treating human cases and livestock industry compensation). The diagnosis of CE is based on imaging techniques such as ultrasound (US), and serologic assays. Once this disease has been diagnosed, different treatments are recommended based on the cysts' location, stage, size and presence of complications. However, **clinical protocols are still lacking** and the **natural history of the infection is still poorly understood,** thus recommendations for diagnosis and treatment have a low evidence base. To summarize, **CE** is **chronic, complex and neglected.**

Heracles - AIMS

The main goals of the **Heracles cooperative project** are to:

- **Identify** the **Eastern European population (EEP) affected by CE** by ultrasound screening;
- Create the **European Registry of Cystic Echinococcosis** (ERCE);
- Establish the **Echino-Bio-Bank** from animal and human CE patients and related Databases;
- Set-up and validate **new molecular-based POC-LOC** (Point Of Care - Lab On a Chip) **kits;**
- Identify the **molecular bases** associated with CE response to therapy or lack thereof, through the study of **host-parasite interplay** ("omic" studies);
- **Increase drug bioavailability** of Albendazole (ABZ);
- **Train experts** working **in Eastern European countries (EEC),** as they are crucial to fight this disease.

Heracles - IMPACT

In the European Union (EU) and adjacent countries, **CE** is considered **highly endemic** in southern and eastern countries such as **Bulgaria, Greece, Italy, Macedonia, Moldova, Romania, Spain** and **Turkey.** In **EEC,** the number of **cases has dramatically increased** in recent years. Thus, the detection of human CE cases and the derived saving for the **National Health Systems** will have through **Heracles** an **immediate socio-economic impact on the EEC.** With the current available options for the control of CE, patients suffering from this disease will be seen for many decades to come. **Heracles offers a chance to break this vicious circle and to put CE on the radar** of health policy makers. The **Heracles project** is designed to provide **new insights** into the **host-parasite relationship and epidemiology, new tools for epidemiological surveillance in animals, parasite infectivity, host immunity, diagnosis, clinical manifestations, improvement of therapy, and follow up in humans. Heracles** will translate the project outputs into **POC-LOC** commercial tools to use in **EEC.** The **ERCE registry** for the surveillance of CE will be created to provide baseline data for future risk calculations and to establish a prospective case retrieval. A better understanding of the host-parasite interplay will ultimately **be useful to improve response to treatment.** The synthesis of a **new enantiomeric drug** based on ABZ will be followed by a **phase 1 clinical trial protocol** in which the pharmacokinetics, safety, and tolerability of the improved formulation will be assessed. Project **stakeholders,** such as the rural populations in areas where CE is endemic, will be engaged as an integral part of the project. **Special events** to increase awareness in the population of how CE is transmitted will be organized. The **results** of **Heracles activities** will **support governments,** the **European Commission** and related European agencies to harmonize data collection, monitoring and reporting of CE, according to the EU Legislation.

Heracles - ALLIANCE

Heracles Consortium is made up of **nine partners,** of which seven are **academic institutions,** one is a small-medium enterprise **(SME)** and one is a **service provider company.** Five countries are represented: **Bulgaria, Italy, Romania, Spain,** and **Turkey.**
All academic partners are internationally recognised groups with important scientific backgrounds in the field of CE. Most members of the consortium are physicians specialized in infectious diseases, medical parasitology, surgery, gastroenterology and radiology. Moreover, the Consortium is composed of experts in several fields, including: veterinary medicine, biology, chemistry, epidemiology, immunology and pharmacology. WPs contained in **Heracles** reflect such **multidisciplinary approach** and members from EEC with experience in these areas are part of the Consortium.

Heracles_updateMay2014_Layout 1 04/06/14 10:08 Pagina 2

ACADEMIC INSTITUTES

Istituto Superiore di Sanità - Italy
www.iss.it

Università degli Studi di Pavia - Italy
www.unipv.eu

Agencia Estatal Consejo Superior de Investigaciones Cientificas - Spain
www.csic.es

Spitalul Clinic Colentina Bucuresti - Romania
www.spitalul-colentina.ro

Hacettepe Üniversitesi - Turkey
www.hacettepe.edu.tr

Hospital for Active Treatment of Infectious and Parasitic Diseases "Prof. I. Kirov" - Bulgaria
www.sbalipb.bg

Namik Kemal Üniversitesi - Turkey
www.nkuen.nku.edu.tr

SMEs

Alta Ricerca e Sviluppo in Biotecnologie S.R.L.U. - Italy
www.altaweb.eu

Vircell S.L. - Spain
en.vircell.com

HERACLES

Human cystic Echinococcosis ReseArch in CentraL and Eastern Societies

PROJECT COORDINATOR

ADRIANO CASULLI, PhD
Department of Infectious, Parasitic and Immunomediated Diseases
ISTITUTO SUPERIORE DI SANITÀ
Viale Regina Elena, 299
00161 Rome
ITALY
adriano.casulli@iss.it

Start date: 01/10/2013
Duration: 48 months

www.Heracles-fp7.eu

EU contribution: 2.861.500 €
Total costs: 3.879.712 €

SEVENTH FRAMEWORK PROGRAMME

HERACLES

Human cystic Echinococcosis ReseArch in CentraL and Eastern Societies

SEVENTH FRAMEWORK PROGRAMME