SITUATION OF CYSTIC ECHINOCOCCOSIS IN HUMANS AND ANIMALS IN ROMANIA: A REAL ALARMING CONCERN

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Teofilia Banu, Vasile Cosma, Loredana Gabriela Popa, Patricia Mihaiescu
Romania
Echinococcosis reported Romanian system

- 2009 - case based reported by all healthcare providers - reported form

DPHA (District Public Health Authorities)

↓ regional level through Communicable Disease Register

↓ national level

- aggregate data reported by all family doctors - National Center of Statistics

- no specific surveillance system
US SCREENING FOR CE IN RURAL AREAS IN ROMANIA

Ialomita County - October 2004
Buzau County - May 2006
Teleorman County - November 2009

4146 screened people - prevalence between 3,7 and 4,9%

- 1.962 screened people
  - 74 cases positive
  - 3.77% out of the 1.962 screened people

- 1.719 screened people
  - 76 cases positive
  - 4.42% out of the 1.719 screened people

- 465 screened people
  - 23 cases positive
  - 4.94% out of the screened people

Selection criteria
- Counties with high number of CE cases
- Facility access in the area, compliance of local GPs
HERACLES FP7 EU Project
October 2013–Sept 2018

- US screening for CE in rural areas of Romania
  64 CE confirmed cases (after exclusion of CL cases)

- Enrolment of new cases of CE admitted in Colentina Hospital, Parasitology Department, Bucharest
  442 cases (2013–2017)
US screening for CE in rural areas
Screening period 2014
2902 screened people
66 pos/suspects (2.23%)

- Giurgiu district
  27.06-04.07.2014
  • 1649 people screened
  • 10 rural areas
  • Results: 44 posi/susp for CE

- Braila district
  29.09-3.10.2014
  • 1253 people screened
  • 4 rural areas
  • Results: 22 posi/susp for CE

Screening period 2015
4567 screened people
62 positive/suspects (1.42%)

- Neamt district
  29.06-3.08.2015
  • 1628 people screened
  • 4 rural areas
  • Results: 19 posi/susp for CE

- Arges district
  06-10.07.2015
  • 1253 people screened
  • 4 rural areas
  • Results: 22 posi/susp for CE

- Vaslui district
  20-24.07.2015
  • 1362 people screened
  • 7 rural areas
  • Results: 21 posi/susp for CE

2014/2015
7469 screened people
127 positive/suspects
Districts areas screened for Echinococcosis in Romania, 2014 and 2015; 7469 subjects
- 7469 screened people
- 127 suspects/positives
- Cases found in all villages
- All US types and sizes (1–22 cm)
- New cases, relapses, history of CE

127 suspects:

- New cases = 28
- History of CE = 39
- Relapses = 7
- CL 28
- Not confirmed
  CE = 25 (CO RO)
Prevalence of abdominal cystic echinococcosis in rural Bulgaria, Romania, and Turkey: a cross-sectional, ultrasound-based, population study from the HERACLES project

Francesca Tamarozzi*, Okan Akhan*, Carmen Michaela Cretu*, Kamenna Vutova*, Devrim Akinci, Rossitza Chipeva, Tursun Corina Manuela Constantin, Massimo Fabiani, Bnaimir Golemanov, Denisa Janta, Patricia Mihailescu, Marin Muhtarov, Marius Petrutescu, Patrizio Pezzotti, Alexandru Cosmin Popa, Loredana Gabriela Popa, Mircea Ioan Popa, Valeri Velev, Maria Enrico Brunetti, Adriano Casulli

Prevalence:
- In Bulgaria 0.41% 000
- In Romania 0.41% 000
- In Turkey 0.57% 000
## Table 1. Number and rate of confirmed echinococcosis cases per 100,000 population, EU/EEA, 2011–2015

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Distribution of CE patients according to gender, 2014–2015, n=127

Discovery rate of CE cases:
- 1.73%/2014 and 1.43%/2015 for female
- 2.47%/2014 and 1.18%/2015 for male
## Discovery rate of CE in screened rural population, 2014–2015

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<th>Rural area of district</th>
<th>Population screened</th>
<th>Number of cases</th>
<th>Rate of CE(%)</th>
<th>Rate of CE(%) After CE confirmation</th>
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<td>Braila</td>
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<td>44</td>
<td>2.7</td>
<td>27 (1.63%)</td>
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<td>Vaslui</td>
<td>1362</td>
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<td>Neamt</td>
<td>1628</td>
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<td>1.2</td>
<td>10 (0.61%)</td>
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<tr>
<td>Arges</td>
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<td>1.4</td>
<td>10 (0.63%)</td>
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<td><strong>Total</strong></td>
<td><strong>7469</strong></td>
<td><strong>127</strong></td>
<td><strong>1.7</strong></td>
<td><strong>64 (0.85%)</strong></td>
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Positive cases or suspects were invited to the hospital for confirmation, allocation to the appropriate treatment and follow up.
Prospective patients

Echinococcosis cases by age group and gender, Romania, 2013-2017, n=442 (722 cysts)

Echinococcosis cases:
- Age: 1-90 (average: 47.45)
- Gender: 58.1% women (257 cases); 41.9% men (185 cases)
- Habitat: 54.1% from rural area, 45.9% from urban area
Stage of the disease (420 cases)

- Primary CE: 338 cases (76.47%)
- Secondary CE: relapses: 84 cases (23.53%)
- Undetermined: 20 cases (4.53%)
Echinococcosis cysts by location, Romania, 2013–2017, n=442

- **RLL** (right lower lung) 81.3% (552 cases)
- **LLL** (left lower lung) 18.6% (103 cases)

Other locations:
- Liver: 449 cases (81.3%)
- Lung: 552 cases (77%)
- Spleen: 4% (28 cases)
- Perineum: 4% (28 cases)
- Kidney: 4% (28 cases)
- Other: 8% (44 cases)

ELISA:
- Pos 287 cases (64.9%)
- Neg 155 cases (35.1%)

Other locations:
- Soft tissues: 9 cysts (1.25%)
- Heart: 6 cysts (0.83%)
- Bone: 5 cysts (0.69%)
- Ovary: 4 cysts (0.55%)
- Muscle: 4 cysts (0.55%)
- CNS: 2 cysts (0.28%)
- Mediastinum: 1 cyst (0.14%)
- Pancreas: 1 cyst (0.14%)
- Psoas: 1 cyst (0.14%)
- Retroperitoneum: 1 cyst (0.14%)

Other locations: 38 cases (4%)
Echinococcosis cysts frequency by cases, Romania, 2013-2017, 722 cysts

- 264 cases with 1 cyst/pts
- 101 cases with 2 cysts/pts
- 41 cases with 3 cysts/pts
- 8 cases with 4 cysts/pts
- 4 cases with 5 cysts/pts
- 17 cases with >5 cysts/pts
- 6 cases with >10 cysts/pts
- 1 case with >30 cysts/pts

Echinococcosis cysts by size, Romania, 2013-2017, 722 cysts

- 11.1% <5cm
- 38.4% 5-10cm
- 50.6% >10cm

No. of CE patients: 722 cysts
Echinococcosis cysts according to WHO classification, Romania, 2013-2017, 658 cysts

CL  CE1  CE2  CE3a  CE3b  CE4  CE5  Res cavity

217  28  70  69  85  133  35  21
H RO 109    Screening

**ABZ 6 Months treatment & Follow up**

6 months

1 year FU – ABZ stopped
H RO 57
Screening 2014

Follow-up -
- 6 Mo
- 8 Mo
- 12 Mo

3rd Euro-Regional Conference on parasitic zoonosis
Timisoara, 4-5 October 2018
Echinococcosis in animals

A surveillance program in intermediary hosts was established to improve the epidemiological knowledge on geographic distribution and prevalence of echinococcosis/hydatidosis in Romania.

In 2014 the IDAH received 308 samples from different intermediary hosts (cattle, sheep, goat, pigs) and 170 (55.19%) were positive for *Echinococcus spp*:

- cattle 167/274 (60.95%)
- sheep 2/23 (8.70%)
- pig 1/11 (9.09%)
Echinococcus granulosus in animals 2014

North-West Centre

North-East Sud-East

West South-West

South
Echinococcosis in animals

In 2015, out of 328 samples examined 149 (48.2%) were positive *Echinococcus spp:*
- **cattle 147/305  (48.19%)**
- **2/7 pig  (51.80%)**
Echinococcus granulosus in animals 2015
- 1 sample G6

**HERACLES Project**
Genotyping 32 cyst samples
- (G1–27; G2–1; G3–4) out of which G1BC –1
Genotyping in animals

  - 56 samples – investigate the DNA sequences
  - 53 were identified as *E. granulosus s.s*
  - 3 were identified as *E. canadensis*, G7 genotype
Three strains were identified with the mitochondrial sequences:

(i) the common sheep strain (G1) which circulates between sheep and cattle and is infective for humans,
(ii) the Tasmanian sheep strain (G2) infecting sheep and cattle,
(iii) the pig strain (G7) predominantly found in swine.

This is the first report which demonstrates

• the occurrence of the Tasmanian sheep strain in cattle
• the sympatric occurrence of these three strains (G1, G2, and G7) in Europe
The epidemiological study conducted in definitive hosts, between December 2011 - May 2012, in different regions of Romania by Onac, Cozma et al.,

- A prevalence of *Echinococcus* spp in dogs from urban areas of 4.3%, using CpAg ELISA assay,
- 2.2% (*E. granulosus* G1) by nPCR in the shepherd dogs
- In foxes, by nPCR the prevalence was 18% (*E. granulosus* G1)

In the definitive hosts (dogs and foxes) only G1 genotype was identified, revealing that in Romania major biological cycle was conducted between dogs and sheep
E. multilocularis was identified in 27 (4.8%) of 561 foxes investigated.
The highest E. multilocularis prevalences of 10.5–14.6% were found in the counties bordering Hungary and the Ukraine.
Coalescence of Human, Animal and Environmental Health highlight the need for One Parasite – One Health
Conclusions

- CE is still a health problem on our territory (74.5% new human cases and presence of the disease in children population)

- Case diagnosis and management should be done in specialized centers, by very well trained specialists

- Notification of all the cases should be strongly recommended

- Mix teams of human and vets specialists should implement as soon as possible and follow a National Control Program

- The testing of intermediate hosts turns out to be an appropriate method for surveillance: testing of cattle may be the surveillance method of choice due to the veterinary slaughtering control and sampling while the slaughtering of pigs and other small ruminants is not as well controlled as cattle slaughtering
Many thanks!
michaelacarmen.cretu@gmail.com