Surveillance strategies for Lyme borreliosis in Belgium

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Epidemiology of infectious diseases
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Surveillance pyramid for Lyme

- Infected wildlife
- Infected (questing) ticks
- Infected
- Tick bites
- Population exposed
- Erythema migrans
- Disseminated Lyme
- Hospitalized
- PTLDS

Braks et al. Parasites & Vectors 2011, 4:192
Surveillance pyramid for Lyme

Infected wildlife

Infected (questing) ticks

Population exposed

Tick bites

Erythema migrans

Disseminated Lyme

Hospitalized

PTLDS

Humtick

Hospital records

Lab network

GP network

Seroprevalence

TekenNet

Humans

Braks et al. Parasites & Vectors 2011, 4:192
1. TekenNet/TiquesNet

- Launch of website June 2015 and application for mobiles in May 2016
- Over 5000 tick bites reported between July and December 2015, by individuals/groups
- 1,087 “long-term” participants, but only 25% regular participation

[tekennet.wiv-isp.be](tekennet.wiv-isp.be)
Highest incidence in provinces of Luxemburg (79/100 000), Limburg (61/100 000), Namur (60/100 000) and Brabant (40-42/100 000)
2. Seroprevalence

- Residual samples (n=3,215) representative of the Belgian population, collected in 2013-2014

- *Borrelia burgdorferi* sl. IgG antibody reactivity by Elisa (Liaison XL) followed by confirmation test (Western Blot) at NRC Lyme (UCL)

- Adjusted* overall seroprevalence of 1.06% (95% CI: 0.67-1.67)

- Estimation on healthy individuals-blood donors in Europe ranges between 1.6% (Slovakia) and 9.5% (Germany)

* Clustered sampling and standardization for age, gender and province
3. Sentinel network of GPs

Incidence of consultation rate (and 95% CI) for tick bite and EM per 10 000 patients, sentinel network of GPs

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Consultation for tick bite</td>
<td>18.6 (17.2-20.0)</td>
<td>18.6 (17.3-20.1)</td>
<td>15.0 (13.2-17.0)</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>Consultation for EM</td>
<td>8.3 (7.4-9.3)</td>
<td>9.0 (8.1-10.0)</td>
<td>9.8 (8.3-11.4)</td>
<td>NS</td>
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→ Estimated 8 000 to 10 000 consultations for EM/year

4. Network of laboratories

Number of positive serological results by week, sentinel network of laboratories, 2000-2015
5. Minimal hospital data

Annual number of hospitalisations for Lyme disease (primary diagnosis), 2004-2013, MZG-RHM
6. Humtick

- Study on
  - health and cost burden of Lyme disease in Belgium
  - occurrence of other tick-borne infections
  - occurrence and risk factors of post-treatment Lyme disease syndrome (PTLDS)
- Starting inclusion patients in June 2016
- Partners: UCL, NRC Lyme (UCL – UZ Leuven), CHERMID, RIVM
Methods

- **Prospective cohort study (6 to 24 months)**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Group 1 EM</th>
<th>Group 2 Disseminated LM</th>
<th>Group 3 Control group</th>
<th>Group 4 Other TB infection</th>
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</thead>
<tbody>
<tr>
<td>Arthritis</td>
<td>No chronic disease</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Neuroborreliosis</td>
<td>Age and gender matched</td>
<td></td>
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<td>Other</td>
<td>Fever &lt; 1 month after tick bite</td>
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</table>

- **Nested case control study for possible risk factors for PTLDS:** co-infection, treatment, gender, severity of acute symptoms, …

*At least 200 GPs in high risk area’s for Lyme
** Screening for *N. mikurensis, A. phagocytophilia, B.miyamotoi, Rickettsia spp., Babesia*
Conclusions

- Different complementary surveillance strategies and research projects on Lyme disease are ongoing
- Up to 2015, no significant increase of Lyme disease has been identified
Acknowledgements!

TeckenNet

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Seroprevalence

Amber Litzroth and Benoît Kabamba-Mukadi

GP network

Sarah Moreels, Viviane Van Casteren and GPs

Laboratory network

All participating labs and NRC Lyme

Hospital data

Data management, MoH

Humtick

Laurence Geebelen and Katrien Tersago