

Motivational and behavioral determinants of prevention against tick bites and Lyme borreliosis: a cross-sectional study among forestry and related workers

Authors: Peter Winderickx (PW), Sofie Acke^{1,2,4}, Mathieu Verbrugghe¹, Marie-Noëlle Schmickler³, Koen De Schrijver⁴

Affiliations: Occupational Physician, Mensura Occupational Health Services, Gaucheretstraat 88/90, 1030 Brussels, Belgium Peter.Winderickx@Mensura.be

¹Department of Research & Development, Mensura Occupational Health Services, Belgium

²Occupational Physician, Mensura Occupational Health Services, Belgium

³Head of the Department of Medicine, Knowledge Center and of the Department of Research & Development, Mensura Occupational Health Services, Belgium

⁴Department of Epidemiology and Social Medicine, University of Antwerp, Belgium

Introduction

Lyme borreliosis is the most important vector transmitted zoonosis in Europe and Belgium. The estimated incidence of erythema migrans is about 10.000 diagnoses per year and therefore endemic in Belgium, with increasing incidence. Forest guards, rangers, forestry- and field workers are high risk professions.

The research questions were as follows:

- 1) What's the occurrence of tick bites and Lyme disease?
- 2) What are behavioral risk factors?
- 3) Which preventive measures have been introduced and how are they used?
- 4) What's the background knowledge?
- 5) What are the motivational determinants that guide the use of preventive measures?

Population and methods

Based on a systematic literature review, a questionnaire was developed and pre-tested among 16 forest guards from the "Agency of Nature and Forest" (ANB).

An observational, retrospective cross-sectional survey was performed among 130 field workers of the "Vlaamse Landmaatschappij" (VLM) in April-June 2017. Based on uni- and multivariate binary and ordinal logistic regression analyses, the motivational and behavioral determinants were identified that influence the application of protective measures, protective behavior, and compliance.

Results

The response rate was 51% (43 men, 23 women).

- 1) 37% of the VLM field workers reported tick bites in 2016, and 9.1% received previous treatment for Lyme disease. Their risk for Lyme disease was 28.9 times higher than for the general population (RR = 28.9), and was in 96.4% caused by professional exposure (AR = 96.4%).
- 2) Their high risk for tick bites and Lyme disease could be explained by the long exposure time of more than 100 days per year during tick season (from March till October), and by having intense tick contact due to the high tick-risk activities, in high risk areas.
- 3) Nobody from the VLM and ANB employees was informed, or used already the application "TekenNet.be" (Sciensano) for reporting.

- 4) 76.9% was aware of having a higher occupational risk; 92.4% didn't receive specific education.
- 5) In multivariate regression analysis, not being aware of the risk, was the most important determinant for not using appropriate preventive measures ($p=0.043$; OR = 0.36 (95% CI 0.13 – 0.97)).

Conclusion

This study confirms that Lyme disease is an important occupational risk. Prevention programs should aim at strengthening preventive motivation by improving risk appraisal, perception and efficacy of coping with protective behavior (body check, wearing protective clothing, repellents); enhancing knowledge of early symptoms; and removing barriers such as low perceived personal risk.