

## ORIGINAL PAPERS

# ***Yersinia* spp. infection among soldiers of Polish Military Contingent serving in stabilization mission EUFOR in Democratic Republic of Congo**

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### SUMMARY

***Yersinia* spp. infection among soldiers of Polish Military Contingent serving in stabilization mission EUFOR in Democratic Republic of Congo**

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Int. Rev. Allergol. Clin. Immunol., 2007; Vol. 13, No. 1

*The outcome of laboratory examination of 121 soldiers of the Polish Military Contingent serving in the stabilization mission EUFOR in the Democratic Republic of Congo from June to December 2006 is presented in this article. The research showed pathological results in case of 81 people. Among them, 44 patients had Yersinia antibodies, including IgM – 2 people, and IgG – 42 people (Y. enterocolica or Y. pseudotuberculosis), which testified to past infection with yersiniosis. Bacteriological examination of stool for Yersinia spp. was negative in all cases. Laboratory examination of Yersinia antibodies before departure of Polish soldiers to the DR Congo was not performed, so it is impossible to determine if infection with yersiniosis occurred in Poland or during the military mission abroad.*

**Key words:** *Yersinia* spp. infection, Polish Military Contingent, Democratic Republic of Congo

From June to December 2006 soldiers of the Polish Military Contingent served in the stabilization mission EUFOR in Democratic Republic of Congo. The main health problem among the Polish population were gastrointestinal tract diseases, which posed 56% of all diseases and traumas treated in the above-mentioned period. Diarrheas with short incubation

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### STRESZCZENIE

**Zakażenie *Yersinia* sp. wśród żołnierzy Polskiego Kontyngentu Wojskowego pełniących służbę w misji stabilizacyjnej EUFOR w Demokratycznej Republice Konga**

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Int. Rev. Allergol. Clin. Immunol., 2007; Vol. 13, No. 1

*W pracy przedstawiono wyniki badań laboratoryjnych 121 żołnierzy Polskiego Kontyngentu Wojskowego, pełniących służbę w misji stabilizacyjnej EUFOR w Demokratycznej Republice Konga w okresie czerwiec-grudzień 2006. Badania wykazały odchylenia od stanu prawidłowego u 81 osób. Wśród nich, u 44 osób stwierdzono dodatni wynik badania na obecność przeciwciał dla Yersinia sp., w tym w klasie IgM – u 2 osób i IgG – u 42 osób (Y. enterocolica lub Y. pseudotuberculosis), świadczący o przebytym zakażeniu yersiniozą. Badanie bakteriologiczne kału w kierunku Yersinia we wszystkich przypadkach dało wynik ujemny. Ponieważ badanie na obecność przeciwciał dla Yersinia nie było wykonywane przed wyjazdem żołnierzy do DR Konga, nie można było stwierdzić czy do zakażenia doszło w Polsce, czy podczas misji wojskowej poza granicami państwa.*

**Słowa kluczowe:** zakażenie *Yersinia* sp., Polski Kontyngent Wojskowy, Demokratyczna Republika Konga

period (1-3 days) and abdominal pain were dominating among them (98 of 121 patients declared at least one case of diarrhea during the stay in the DR Congo). Soldiers associated the appearance of diarrheas with the consumption of vegetable salads in the dining facility of the EUFOR military base. Potable water was exclusively bottled water, however it



was not synonymous with epidemiological safety. In November 2006, during routine microbiological examination of bottled water (mineral water made in the DR Congo), *Pseudomonas aeruginosa* was detected. Toilets in the military base were cleaned by local workers, who defecated in the same places as EUFOR soldiers, which undoubtedly posed another epidemiological threat of gastrointestinal tract diseases.

Polish soldiers who take part in military missions abroad undergo a series of laboratory examinations before deployment. Unfortunately, bacteriological examination of stool and immunodiagnosis of infectious alimentary tract diseases are not executed.

The aim of the study was to assess laboratory examination of Polish soldiers after their comeback from the mission in the DR Congo, a country located in different climatic and sanitary conditions, in the aspect of bacillary gastrointestinal diseases.

## MATERIAL AND METHODS

Laboratory examination of 121 soldiers of the Polish Military Contingent serving in the stabilization mission EUFOR in the Democratic Republic of Congo from June to December 2006 was conducted after their comeback to Poland.

The following investigations were performed: blood sedimentation, blood morphology, blood chemistry (creatinine, urea, bilirubin, uric acid, cholesterol, glucose, transaminases, ionogram), serology (HBsAg, anti-HIV, anti-HCV, USR, IgM and IgG class *Yersinia* antibodies), parasitological examination of stool (worms, *Entamoeba histolytica*), parasitological examination of blood (*Plasmodium* spp.), bacteriological examination of stool (*Salmonella* spp., *Shigella* spp., *Vibrio cholerae*, *Salmonella typhi*, *Escherichia coli* O157 – EHEC, *Yersinia* spp., *Aeromonas* spp.).

## RESULTS

The research showed pathological results in case of 81 people. Among them, 44 patients had *Yersinia* antibodies, including IgM class – 2 people, and IgG class – 42 people (*Y. enterocolica* or *Y. pseudotuberculosis*), which testified to past infection with yersiniosis. Bacteriological examination of stool for *Yersinia* spp. was negative.

## DISCUSSION

*Yersinia* spp., Gram-negative bacterial infection (*Y. enterocolica*, *Y. pseudo-tuberculosis*) is said to have a world-wide distribution, but it is found much more commonly in the temperate zones than in the tropics [1]. Even in temperate countries infection is more prevalent in colder climates and is more common in winter [2]. However, cases of generalized infection have been recorded in Subsaharan countries of Africa, e.g. serological evidence of infection has been found in Nigeria [3]. There are no official results concerning the incidence of yersiniosis in the Democratic Republic of Congo [4]. The reservoir for *Y. enterocolica* is a variety of animal species, including birds, fish, snails and most mammals. The organism is excreted in faeces from pigs and cattle and can persist in lakes, streams, soils and vegetables. Humans become infected by ingesting contaminated food or water [5]. The incubation period is 1-11 days and bacteria are excreted for 14-97 (mean 42) days. Characteristically, clinical features consist of diarrhea, low-grade fever and abdominal pain [6]. Nausea, vomiting, headache and pharyngitis are minor presentations [7]. Most symptomatic infections are in children under 5 years old. Asymptomatic infections are more likely to occur in adults. *Yersinia enterocolica* can be isolated from stool. For retrospective diagnosis, serology using ELISA, whole cell agglutination, or a complement fixation test can be performed [8].

**Table 1.** Laboratory examination of Polish soldiers serving in DR Congo from June to December 2006

Type of examination	Number of patients with pathological results (increase of value)
Blood sedimentation	3
Blood morphology	14 (leucocytosis, eosinophilia)
Blood biochemistry	42 (creatinine – 16, urea – 2, bilirubin – 21, transaminases – 5, uric acid – 6, cholesterol – 5)
Urine test	3 (erythrocyturia)
Serological examination	0 (HBsAg, anti-HIV, anti-HCV, USR)
Prevalence of <i>Yersinia</i> antibodies (immunoassay ELISA)	<i>Yersinia</i> IgM (+) positive (>24 U/l) – 2, <i>Yersinia</i> IgG (+) positive (>24 U/l) – 42
Parasitological examination of stool	0
Parasitological examination of blood	0
Bacteriological examination of stool	0

## CONCLUSIONS

1. Medical examination of 121 Polish soldiers serving in the Democratic Republic of Congo from June to December 2006 did not show symptoms of current contagious or parasitic disease.
2. Laboratory research showed pathological results in case of 81 people. Among them, 44 patients had *Yersinia* antibodies: *Yersinia* IgM – 2 people, and *Yersinia* IgG – 42 people (*Y. enterocolica* or *Y. pseudotuberculosis*), which testified to past infection with yersiniosis. Bacteriological examination of stool for *Yersinia spp.* was negative.
3. Laboratory examination of *Yersinia* antibodies before departure of Polish soldiers to the DR Congo was not performed, so it is impossible to determine if infection with yersiniosis occurred in Poland or during the military mission abroad.

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