



SHORT COMMUNICATION

**Investigation of *Enterobius vermicularis* contamination
in playgrounds and public transportation vehicles**

Cansu Dedeoğlu¹, Esmâ Kozan^{2*}

Özet

Dedeoğlu C, Kozan E. Çocuk parkları ile toplu taşıma araçlarının *Enterobius vermicularis* kontaminasyonu yönünden incelenmesi. **Eurasian J Vet Sci, 2011, 27, 4, 251-253**

Bu çalışmanın amacı Afyonkarahisar'da çocuk parkları ile toplu taşıma araçlarının *Enterobius vermicularis* kontaminasyonu açısından değerlendirilmesidir. Araştırma il merkezinde çalışan ve rastgele seçilen 38 toplu taşıma aracı ile yine merkezde bulunan ve rastgele seçilen 9 farklı çocuk parkında yürütülmüştür. Selofan bant tekniği kullanılarak incelenen ve çocuk parklarından temin edilen 126 örneğin hiçbirisinde *E. vermicularis* yumurtasına rastlanmazken, toplu taşıma araçlarından temin edilen ve aynı yöntemle incelenen 150 örneğin 2'sinde (% 1.33) *E. vermicularis* yumurtası tespit edilmiştir. Afyonkarahisar'da toplu taşıma araçlarının *E. vermicularis*'in bulaşmasında etkili olabileceği ve toplu kullanıma açık alanlarda hijyene daha fazla dikkat edilmesi gerektiği gözlenmiştir.

Abstract

Dedeoğlu C, Kozan E. Investigation of *Enterobius vermicularis* contamination in playgrounds and public transportation vehicles. **Eurasian J Vet Sci, 2011, 27, 4, 251-253**

The aim of this research was to investigate *Enterobius vermicularis* contamination in playgrounds and public transportation vehicles in Afyonkarahisar province. The research was conducted in randomly selected 38 public transportation vehicles providing service in the city centre and in randomly selected 9 playgrounds. *E. vermicularis* eggs were not detected in any of the 126 samples taken from the playgrounds using the cellophane tape method. On the other hand, the examination of the 150 samples taken from public transportation vehicles by the same method demonstrated the presence of *E. vermicularis* eggs in 2 (1.33%) of the samples. It was concluded that public transportation vehicles may play a role in the transmission of *E. vermicularis*. Therefore, hygiene conditions should be improved in public areas.

¹Undergraduate Student of Faculty of Veterinary Medicine,
²Department of Parasitology, Faculty of Veterinary Medicine,
University of Afyon Kocatepe, 03200, Afyonkarahisar, Turkey

Received: 16.09.2006, Accepted: 03.10.2011
*esmakozan@aku.edu.tr

Anahtar kelimeler: *Enterobius vermicularis*, kontaminasyon

Keywords: *Enterobius vermicularis*, contamination

Although intestinal parasites remain a major health problem across the globe, rates of infection vary among different communities owing to different social, cultural, ecologic, and hygienic conditions (Altındış et al 2004, Giray and Keskinoglu 2006). Particularly in public areas, inadequacies in both environmental and personal hygiene promote the transmission of parasitic diseases (Doğan and Akgün 1998). Previous research has shown that intestinal parasites are observed primarily in growing children and may cause serious problems, including malabsorption, malnutrition, anaemia, growth retardation, behavioral disorders, trouble in adapting to the environment and learning disability (Crompton 1993, Crompton 2002, Giray and Keskinoglu 2006, Daldal et al 2007).

Enterobius vermicularis Linnaeus, 1785 is a cosmopolitan species, which localises in the caecum and appendix in man and is observed more commonly in temperate climatic zones (Anderson 2000). It may also be found in higher primates, including the chimpanzee and monkey (Soulsby 1982). The biological cycle of *E. vermicularis*, which differs from that of other intestinal parasites, brings about the creation of a higher number of contamination foci in regions, where the infection exists, and also facilitates the occurrence of reinfections. The most significant routes of infection are through the alimentary canal and respiratory tract. Oral infection occurs through the faecal-oral route by means of nail biting and/or the consumption of contaminated food. Respiratory infection occurs through the inhalation of the airborne eggs of the parasite (Atias 1999).

In general, enterobiasis is asymptomatic with the most common clinical manifestation being anal itching. Infected children may display insomnia, fatigue, irritability and sometimes abdominal pain (Atias 1999, Yoon 2000).

In order to reduce the prevalence of parasitic diseases, social and economic conditions should be improved; and basic hygiene should be ensured and maintained. The alteration of cultural habits and sanitation training also bear great significance (Tavares-Dias and Grandini 1999). Previous research has also shown that public transportation vehicles act as an important source of infection (Pereira et al 2004, Justino et al 2005, Taketomi et al 2006).

The present study was aimed at determining the risk posed by playgrounds and public transportation vehicles in Afyonkarahisar province as regards the transmission of *E. vermicularis*, which constitutes a major health problem in children.

The research was conducted (between September 2010 and August 2011) in randomly selected 38 public transportation vehicles providing service in the city centre and in randomly selected 9 playgrounds. When seasonal circumstances permitted, playgrounds frequented by children were visited and pieces of trans-

parent cellophane tape were applied to frequent hand contact sites. From both public transportation vehicles and playgrounds at least 4 different locations were sampled. These cellophane tape pieces were used to prepare microscopic slide mounts and were transferred to the laboratory. The same procedure was followed in the sampling of frequent hand contact sites in public transportation vehicles. The cellophane tape preparations were examined for the presence of *E. vermicularis* eggs in the laboratory (Graham 1941). While *E. vermicularis* eggs were determined in none of the 126 samples taken from playgrounds, the eggs of the parasite were detected in 2 (1.33%) out of the 150 samples taken from public transportation vehicles. In one sample only one infective egg and in the other sample four infective eggs were counted. The eggs of the parasite may be transmitted through several different routes (faecal-oral route, food, dust and retrograde infection) and survive for a period up to 14 days. Therefore, contamination foci are established around infected individuals and aid in the continuation of the infection. As the biology of the parasite requires no intermediate host, the infection can be easily transmitted among humans (Lohiya et al 2000).

In conclusion, public transportation vehicles may act as contamination foci in the transmission of *E. vermicularis* infection in Afyonkarahisar province. Therefore, environmental hygiene in public areas and personal hygiene should be improved. Furthermore, public awareness should be raised and training studies should be performed.

► Acknowledgements

This research was financially supported under the 2209-Support Programme for National/International Research Projects of Undergraduate Students of the Department for Academic Research Funding of the Scientific and Technical Research Council of Turkey (TUBITAK).

► References

- Altındış M, Aktepe OC, Çetinkaya Z, Çiftçi İH, Kıyıldı N, Akbıyık E, 2004. AKÜ Tıp Fakültesi Hastanesinde Parazit Saptanma Oranları. Kocatepe Tıp Derg, 5, 29-32.
- Anderson C, 2000. Nematode Parasites of Vertebrates: Their Development and Transmission. 2nd edition, CABI Publishing, Wallingford, Oxon, UK, p: 236.
- Atias A, 1999. Enterobiasis u Oxiuriasis, in: Parasitologia Medica, Ed; Atias A, Editorial Mediterraneo, Santiago, Chile, pp: 188-193.
- Crompton DWT, 1993. Human nutrition and parasitic infection. Parasitology, 107, 1-190.
- Crompton DWT, 2002. Nesheim MC. Nutritional impact of intestinal helminthiasis during the human life cycle. Ann Rev Nutr, 22, 35-39.
- Daldal N, Karaman Ü, Aycan ÖM, Çolak C, Miman Ö, Çelik T, Atambay M, 2007. Çocuk yuvası ve yetiştirme kurumundaki çocuklarda bağırsak parazitleri yaygınlığının incelenmesi. İnönü Üniv Tıp Fak Derg, 14, 231-235.

- Doğan N, Akgün Y, 1998. Eskişehir yetiştirme yurdunda bağırsak parazitleri prevalansı. T Parazit Derg, 22, 282-286.
- Giray H, Keskinöğlü P, 2006. İlkokul öğrencilerinde Enterobius vermicularis varlığı ve etkileyen etmenler. Türkiye Parazit Derg, 30, 99-102.
- Graham CF, 1941. A device for the diagnosis of Enterobius-vermicularis. Amer J Trop Med, 21, 159-161.
- Justino CM, Pereira FL, Segundo GRS, Sopelete MC, Silva DAO, Sung SSJ, Taketomi EA, 2005. Exposição alérgica em veículos privados de passeio e de transporte escolar em Uberlândia. MG Rev Bras Alerg Immunopatol, 28, 94-98
- Lohiya GS, Tan-Figueroa L, Crinella FM, Lohiya S, 2000. Epidemiology and control of enterobiasis in a developmental center. West J Med, 172, 305-308.
- Pereira FL, Silva DAO, Sopelete MC, Sung SS, Taketomi EA, 2004. Mite and cat allergen exposure in Brazilian public transport vehicles. Ann Allergy Asthma Immunol, 93, 179-184.
- Soulsby EJL, 1982. Helminths, Arthropods and Protozoa of Domesticated Animals, 7th edition, London Bailliere Tindal, UK, p: 159.
- Taketomi EA, Justino CM, Pereira FL, Segundo GR, Sopelete MC, Sung SJ, Silva DA, 2006. Taxis but not private cars are mite allergen reservoirs in Brazil. J Investig Allergol Clin Immunol, 16, 34-36.
- Tavares-Dias M, Grandini AA, 1999. Prevalência e aspectos epidemiológicos de enteroparasitoses na população de São José da Bela Vista, São Paulo. Rev Soc Bras Med Trop, 32, 63-65
- Yoon HY, Choi YJ, Lee SU, Park HY, Huh S, Yang YS, 2000. Enterobius vermicularis egg positive rate of pre-school children in Chunchon, Korea (1999). Korean J Parasitol, 38, 279-281.