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Faecal Carriage of *Listeria monocytogenes* in Stray Dogs in Bursa Province, Turkey

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Abstract: The faecal carriage rate of *Listeria monocytogenes* in stray dogs in Bursa province, Turkey, was determined from 82 faecal samples by bacteriological methods. *L. monocytogenes* was isolated from only one (1.22%) of the samples examined. The isolate was serotyped as 1/2b. It was concluded that stray dogs could be a reservoir of the organism as well as a source of human listeriosis in Turkey. This is the first report on the isolation of *L. monocytogenes* from a dog in this country.

Key Words: Dog, faeces, *Listeria monocytogenes*

Türkiye'nin Bursa İlindeki Sokak Köpeklerinin Gaytalarında *Listeria monocytogenes* Taşıyıcılığı

Özet: Sokak köpeklerinin gaytalarında *Listeria monocytogenes* taşıyıcılık oranının belirlenmesi amacıyla yapılan bu çalışmada, Türkiye'nin Bursa ilinde temin edilen toplam 82 adet gayta örneği bakteriyolojik metotlar kullanılarak incelendi. İncelenen örneklerin yalnız bir adedinden (%1,22) *L. monocytogenes* izole edildi. İzolat 1/2b olarak serotiplendirildi. Sonuç olarak, Türkiye'deki sokak köpeklerinin *L. monocytogenes*'in rezervuarı olabileceği ve insanlardaki listeriosis vakalarının kaynağını oluşturabileceği düşünüldü. Bu çalışma, Türkiye'de bir köpekten *L. monocytogenes* izolasyonu ile ilgili ilk rapordur.

Anahtar Sözcükler: Köpek, gayta, *Listeria monocytogenes*

Listeria monocytogenes, causing infections characterised by meningo-encephalitis, septicaemia and abortion in animals and humans (1), is distributed in the environment and can be found in soil, sewage, and silage. It can also be isolated from the faeces of healthy animals and humans (2).

In epidemiological studies examining the prevalence of *L. monocytogenes* in domestic and wild animals, faecal carriage rates were 2.0%-6.0% in cattle (3-5), 4.0% in buffaloes (6), 0.8% in pigs (4), 1.0% in wild boars (7), 1.25% in monkeys (8), 6.5% in rats (4), 0.79% in martens (8), 0.17% in broilers (9), 0.86% in pigeons (10), 9.5% in gulls (11), and 1.66% in crows (8).

The agent has also been detected in the intestinal contents of dogs in several parts of the world, with a prevalence of 0.7%-1.3% (4,8,10,12,13), and thus presents a health risk for humans where humans and dogs are in close contact. In Turkey, reports on the isolation of *L. monocytogenes* from animals have been limited to food-producing animals and the prevalence rates for chickens, sheep, and cattle have been reported as 4.36%, 0.58%-1.11%, and 1.53%, respectively (14,15). This study was carried out to investigate the possible presence and the carriage rate of *L. monocytogenes* in the intestinal contents of stray dogs.

Rectal swabs from 82 stray dogs kept in the dog shelter of Nilüfer Municipality in Bursa province were

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collected aseptically in Carry-Blair Transport Medium (Oxoid CM519) and transported on ice to the laboratory. Forty-nine (60%) of the dogs were apparently healthy and the others (40%) were diarrhoeic at the time of sampling. The dogs were cross-breeds except for 4 (2 terriers, 1 kangal, 1 boxer) and were between the ages of 1 month and 5 years. Of the dogs, 45 (55%) were males, and 37 (45%) were females.

The samples were transferred into 0.1% peptone water and faecal suspensions were prepared by shaking. Then 0.1 ml of each faecal suspension was added to 9 ml of Listeria Enrichment Broth (Listeria Enrichment Broth Base-Oxoid CM862 plus Listeria Selective Enrichment Supplement-Oxoid SR141) and incubated at 30 °C for up to 7 days. After 24 h, 48 h, and 7 days, 0.1 ml of each selective enrichment broth was inoculated onto Listeria Selective Medium (Listeria Selective Agar Base-Oxoid CM856 plus Listeria Selective Enrichment Supplement-Oxoid SR141) plates and incubated at 35 °C for up to 48 h. Typical colonies of Listeria were picked off the positive plate after incubation and were characterised using standard procedures (2,16). The isolate was also identified by BD Phoenix Automated Microbiology System (BD Diagnostic Systems, Sparks, MD, USA).

The isolate was serotyped on the basis of somatic and flagellar antigens using Listeria O and H antisera (Denka Seiken 214362, Tokyo, Japan).

L. monocytogenes was isolated from only 1 (1.22%) of 82 faecal samples from stray dogs. The dog from which *L. monocytogenes* was isolated was 3 years old, cross-breed, and female, and apparently healthy at the time of sampling. The isolate was serotyped as 1/2b on the basis of somatic and flagellar antigens.

The faecal carriage rate of *L. monocytogenes* in dogs has not been investigated in most countries, including Turkey. In Finland, the isolation rate of *L. monocytogenes* from the intestinal contents of dogs was reported as 0.7% (13). In Germany, *L. monocytogenes* was isolated from 4 (1.3%) of 300 faecal samples from dogs and the isolates were classified into serotypes 1/2b (3 strains) and 4ab (1 strain) (10). In Japan, Iida et al. (4,12) reported that the prevalence of *L. monocytogenes* in the intestinal contents of healthy dogs was 0.9% (5/540) and the serotypes identified were 1/2c (1 strain), 4b (2 strains), and 4 (2 strains). Yoshida et al. (8) investigated the incidence of the bacteria in raccoon dogs in Japan. Of the 104 raccoon dogs examined, only 1 (0.96%) was positive for the presence of *L. monocytogenes* and the serotype was identified as 4c.

In our study, the faecal carriage rate of *L. monocytogenes* was 1.22% in the dogs examined. This rate is similar to those mentioned above. The isolate was classified into serotype 1/2b in our study. This serotype is 1 of the 3 serotypes of *L. monocytogenes* (1/2a, 1/2b, and 4b), which are the most common causes of human listeriosis (1,4,17). Iida et al. (4) reported that 10 (25.64%), 7 (17.95%), and 22 (56.41%) of 39 listeriosis patients and 17 (0.57%), 9 (0.30%), and 10 (0.34%) of 2970 healthy humans were positive for carrying *L. monocytogenes* serotypes 1/2a, 1/2b, and 4b, respectively.

It is concluded that stray dogs might serve as a reservoir of *L. monocytogenes* and even be a source for listeriosis in humans in Bursa province, Turkey. Additional studies are needed to clarify the epidemiological relationship between *L. monocytogenes* isolated from dogs and humans in Turkey with regard to public health.

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