

Research Note

INFLUENCES OF THE PREVENTIVE USE OF ANTIFILARIAL DRUGS ON THE TRANSMISSION OF *DIROFILARIA IMMITIS* IN HOUSE-DOGS IN NAGASAKI CITY, JAPAN

TSUTOMU ODA¹, MARIKO MINE², OSAMU SUENAGA³, KENJI KUROKAWA⁴,
KOICHIRO FUJITA⁵, KATSUTOMO KATO⁶ AND HIROYUKI TAHARA⁶

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The microfilarial prevalence of *Dirofilaria immitis* in house-dogs in the southern and northern parts of Nagasaki City decreased for 27 years from 1968 to 1994 (Oda *et al.*, 1993, 1995). Oda *et al.* (1994a, 1996) reported that the decrease in the number of the main vector mosquito, *Culex pipiens pallens*, in parallel with the expansion of public sewage system and the increase of indoor-kept dogs were related to the reduction of the prevalence. The rate of dogs that was given the

antifilarial drug against microfilaria (Mf) of *D. immitis* was estimated not to be important to the reduction, because the rate was found not high and about similar in questionnaire surveys in 1989 and 1993 (Oda *et al.*, 1994b). However, Oka *et al.* (1988) reported that the Mf prevalence of *D. immitis* in house-dogs examined in a domestic animal hospital has been decreasing gradually for 30 years since 1956 in Tama district in Tokyo, and the increase of dog-owners using the antifilarial

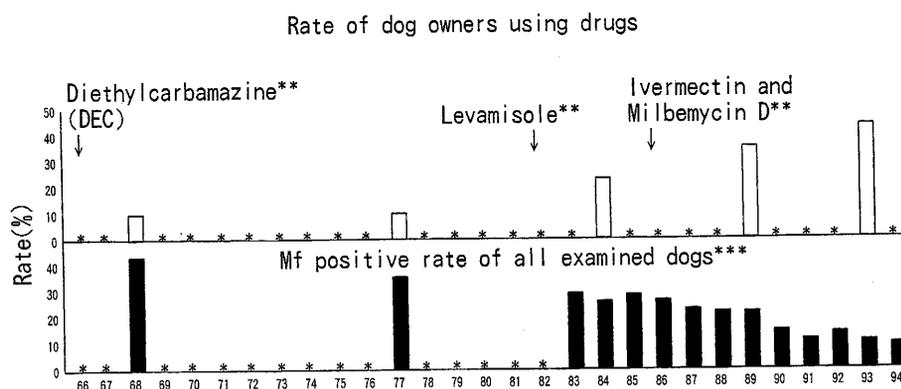


Figure 1 Annual changes in rate of dog owners using antifilarial drugs (upper) and Mf positive rate of *Dirofilaria immitis* in house-dogs (lower) in Nagasaki City.

*Data not available.

**Data on new drugs are cited from Ohishi (1990).

***Cited from Oda *et al.*, 1995.

- 1 Department of General Education, the School of Allied Medical Sciences, Nagasaki University, 1-7-1 Sakamoto, Nagasaki 852, Japan
- 2 Scientific Data Center of Atomic Bomb Disaster, Nagasaki University School of Medicine, 1-12-4 Sakamoto, Nagasaki 852, Japan
- 3 Reference Center, Institute of Tropical Medicine, Nagasaki University, 1-12-4 Sakamoto, Nagasaki 852, Japan
- 4 Department of Bacteriology, Nagasaki University School of Medicine, 1-12-4 Sakamoto, Nagasaki 852, Japan
- 5 Department of Medical Zoology, Faculty of Medicine, Tokyo Medical and Dental University, 1-5-45 Yushima, Bunkyo-ku, Tokyo 113, Japan
- 6 Department of Physical Therapy, the School of Allied Medical Sciences, Nagasaki University, 1-7-1 Sakamoto, Nagasaki 852, Japan

Table 1 Comparison of positive rates between dogs with and without use of antifilarial drug*

| Year | Dogs with drug-use | | Dogs without drug-use | |
|------|--------------------|------------------|-----------------------|------------------|
| | No. examined | No. positive (%) | No. examined | No. positive (%) |
| 1989 | 72 | 15 (20.8) | 134 | 25 (18.7) |
| 1993 | 90 | 5 (5.6) | 111 | 12 (10.8) |

*Dogs with or without drug-use were determined according to questionnaire survey. (Oda *et al.*, 1994b).

drugs and of small-sized dogs kept indoors became important to the decrease of Mf prevalence. We reexamined whether or not the use of the drug by dog-owners contributed to the reduction of the Mf positive rate during recent 27 years in Nagasaki City.

Fig. 1 shows the year-to-year change in the rate of dog-owners using antifilarial drugs in relation to the appearance of the drugs and the Mf positive rate of dogs in Nagasaki City. The rate of dog-owners was utilized from a record of a joint meeting of veterinarians in 1983, question to 43 dog-owners at blood examination for *Dirofilaria* Mf in 1984 and questionnaire surveys in 1989 and 1993. Diethylcarbamazine became commercially available in 1966. During the decade starting from 1966, the rate of dog-owners who used the drugs in Nagasaki City was very low (it was assumed to be about 10% or less), and the Mf positive rate of dogs did not change markedly during the same period. Levamisole became commercially available in 1982, and ivermectin and milbemycin D in 1986. The rate of dog-owners using the drugs increased from 1984, and Mf positive rate of dogs began to decrease from around 1983. To make clear a relationship between these rates, we compared the Mf positive rates between dogs with drug-use and those without drug-use according to questionnaire surveys in 1989 and 1993 (Table 1). Positive rates were not significantly different between dogs with drug-use and those without drug-use. Therefore, decrease in Mf positive rate does not seem to be related to the increase in the rate of dog-owners who used drug. This may be due to the low rate of dog-owners using drugs for a sufficient period to allow complete elimination of *D. immitis* infection in house-dogs, because only about 20% of the drug-using owners used these antifilarial drugs regularly, according to questionnaire surveys (Oda *et al.*, 1994b).

On the other hand, Oka *et al.* (1988) showed that the infection rate of *D. immitis* in house-dogs examined in Tokyo was 33.3% in 1956 to 1957, and this rate decreased gradually to 13.6% in 1984 to 1985. Oka *et al.* (1988) speculated that the increase in the rate of

drug-using owners as well as the increase of the small-sized dogs kept indoors played important roles in the reduction of the Mf infection rate. The microfilarial prevalence was reduced both in Tokyo and in Nagasaki, but the relative importance of the factors reducing the transmission of *D. immitis* seemed to be different in the two cities.

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