Current Status of Animal Rabies in Thailand

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ABSTRACT. Canine rabies remains a serious public health problem in Thailand. The Queen Saovabha Memorial Institute (QSMI) is the principal rabies diagnostic center in central Thailand. The retrospective study of canine rabies cases submitted in 1992–1995 revealed that: (1) The prevalence of rabid dogs decreased, which was associated with an overall decrease in the number of animals examined. However, the proportion of FA positive dogs examined remains the same at approximately 50%. (2) The majority of rabies cases occurred in domestic dogs rather than stray dogs but the ratio of positive cases between domestic and stray animals remained the same. (3) More than 60% of domestic rabid dogs were below age one. Dogs at this age are thought to be more active and also most likely not adequately vaccinated. It should be noted that approximately 70% of rabid dogs were never vaccinated against rabies. — **KEY WORDS:** diagnosis of rabies, ecology of rabies, rabies, Thailand.

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The incidence of human rabies in Thailand has declined, and only 73 cases were reported in 1995 among the human population of approximately 60 million (0.11 case per 100,000). This can be compared with 210 human rabies deaths recorded in 1985 (0.41 case per 100,000). Canine rabies, however, remains a major public health problem and the reduction in human deaths is mostly attributed to the fact that “a state of the art” treatment for human animal bite victims is available throughout the Kingdom and that the public has been educated concerning the management of human exposures. The discontinuation in 1985 of the human vaccine derived from nervous tissue also contributed to an increase in the utilization of modern postexposure treatment by the public. Between 1992 and 1995 there were 150,000 annual human postexposure treatments reported at the total cost of more than US\$4 million. Patients treated at private hospitals and clinics were not included in this figure. This represents a heavy burden for a developing country. Dogs are the major reservoir and vector of rabies in South-East Asia. This study attempts to give an overview of one center’s diagnostic services for animal rabies during 1995.

MATERIALS AND METHODS

The Queen Saovabha Memorial Institute (QSMI) is the major animal bite treatment center in Metropolitan Bangkok. Thirty to forty human animal bite cases are seen daily, and every month approximately 150 animals are examined clinically and at necropsy. All suspected rabid animals presented between January and December 1995 were examined. The owners or persons who brought animals to the QSMI were interviewed by veterinary assistants. The origin, behavior and health history of each animal were recorded and the animal, if alive, was examined by a staff

veterinarian and placed under observation for at least 14 days. Dead animals were autopsied and the total of six tissue samples were taken from the spinal cord and brain of each animal. These were placed on glass slides, stained with BBL anti-rabies globulin fluorescein labeled (Becton Dickinson Microbiology Systems, 250 Schilling Circle, Cockeysville, MD 21030, U.S.A.) and examined under the fluorescent microscope. Fluorescent antibody negative samples were injected intracerebrally into three mice as “fail-safe” controls. Using these procedures, we experienced a false negative rate of 1 per 6,260 animal brains examined during the past three years.

RESULTS

The total of 1,443 animals were examined for rabies at the QSMI during 1995. Figure 1 shows the number of animals examined in the laboratory and the number of positive cases for rabies. Those listed as “other animals” included 24 cats. Table 1 shows the incidence of rabies among owned and stray or community dogs during 1992–1995. The sex ratio of rabid dogs was 60% male and 32% female. Previous studies indicated that the overall sex ratio (male: female) among the general dog population in Bangkok was 1.7:1. The sex could not be determined in eight animals since only their heads were available for examination. The youngest rabies-positive dog was one month old and the oldest 12 years old (this dog was never vaccinated). The age distribution is shown in Fig. 2. It should be noted that 62% of rabid animals were below age one. Figure 3 shows that 70% of rabid dogs were never vaccinated.

DISCUSSION

The human population of Bangkok increased during the past decade and is now well over 10 million. Associated with this is an increase in the dog population. However,

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Fig. 1. Positivity rate of rabies laboratory diagnosis in animals (QSMI, 1995).

Table 1. Ownership status of rabid dogs at QSMI, 1992–1995

Year	Dogs examined	Rabid dogs			
		Total	Domestic (%)	Stray (%)	Unknown (%)
1992	2104	1065	578 (54)	487 (46)	0 (0)
1993	1667	839	444 (53)	395 (47)	0 (0)
1994	1406	689	360 (52)	299 (43)	30 (4)
1995	1175	595	330 (55)	251 (42)	14 (2)

Fig. 2. Ages of domestic rabid dogs (QSMI, 1995).

there has been a decrease in the total number of dogs examined at the QSMI between 1992 and 1995 (Table 1). It is considered that, due to an increase of other rabies diagnostic centers within central Thailand, there has been a decrease in animals brought to Bangkok for diagnosis from neighboring provinces. It is confirmed that lack of or inadequate vaccination of owned dogs as well as stray animals remains the major cause of the continuing epizootics of canine rabies in Thailand. Feeding of stray and

community dogs on the streets continues, and the control of the dog population and their movement has not been effectively implemented.

The predominance of young dogs that are most active among those found rabid is striking. It is believed that stray dogs have a short life expectancy with rapid pupulation turnover [11]. This was also emphasized recently in a paper by Perry [5]. Previous studies by Haddad [2], Tepsumethanon *et al.* [10] and Sage *et al.* [8] showed that

Fig. 3. Rabies vaccination status of rabid dogs (QSMI, 1995).

one-dose primo-rabies vaccination does not lead to long-term immunity against rabies in dogs. This should come as no surprise, as it is long known in humans that repeated preexposure-vaccination is required to produce long-term humoral immunity [12]. Few of street dogs in Bangkok live long enough or have an opportunity to receive booster vaccinations. The senior author has never encountered a rabid dog among animals vaccinated every year. The senior author has never encountered a rabid dog among animals vaccinated every year. The highest incidence of rabies in Bangkok occurs between January and March, a few months after the canine breeding season. This has been reported elsewhere [3].

It is recommended that in Thailand puppies are vaccinated with a booster at six months shortly before the age of three months as maternal immunity lasts for approximately three months [9]. However, we encountered 38 unvaccinated puppies, less than three months old, that died of rabies during 1995. This could be due to the absence of vaccination of their mothers, an inadequate transplacental transmission of neutralizing antibodies from mothers to puppies or a more rapid fall of passively transmitted antibody level. Dogs younger than three months of age are clearly at high risk of rabies. They are also more often in close contact with their owners, which presents a high risk to man. Further studies on more intensive vaccination programmes for young dogs are necessary and, once formulated, the programmes should be implemented immediately along with other measures of dog control [13].

Regular vaccination programmes in an entire community are expensive and labor intensive [13]. In order to make a vaccination programme effective and to significantly reduce canine rabies, they have to be carried out frequently with the goal of immunizing at least 75% of the dog population every year [9]. Perry recently challenged the public health community in Africa to study more innovative methods and technologies that might bring affordable, long lasting, practical and comprehensive dog vaccination to developing countries [5]. The technology of production of long acting (repository) animal vaccines is available, but we are not aware of any manufacturers who are doing developmental

work for such products since such products are of little interest in Europe, America, Japan, Australia, Korea or other profitable markets [1, 4]. Oral vaccination of stray (community) dogs with one of new recombinant rabies vaccines is possible and could probably be employed for mass vaccination if there is a will on the part of governments [6, 7]. Such new technologies need to be urgently studied in field trials at suitable locations where there is a large population of stray dogs with endemic rabies.

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