

Rabies In 5-Week-Old Puppies In Jos, Plateau State Nigeria: A Case Report.

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SUMMARY: Rabies has been an endemic disease in Nigeria with vaccination and control of stray dogs as the major control measures. The disease remains one of the most important zoonoses in the country. A clinical case reported to the veterinary clinic, FCAH&PT, NVRI, Vom in February 2006 is being reviewed. The occurrence of rabies in 5-week old puppies that is below the recommended 3 months age of vaccination is a thing of concern. Equally disturbing is the fact that the puppies are off-springs of a dam vaccinated with MLV/CEO, LEP, an indigenous vaccine. Possible factors responsible for the puppies succumbing to the disease are discussed and recommendations made.

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INTRODUCTION.

Rabies was first reported in Nigeria in 1912 in two persons but the first laboratory confirmation was in 1925 by demonstration of Negri bodies in the brain smear of a mad dog (Ekele, *et al.*, 1984).

The disease has been declared endemic in Nigeria (Boulger and Hardy, 1960; Bernejee and Elegbe, 1970; Owolodun. 1969; Nuru, 1973; Nawathe, 1980 and Umoh and Belino, 1979). The control of the disease has largely been vaccination and control of stray dogs (Ekele, *et al.*, 1984). The first vaccine to be used in both animals and man was rabies vaccine (Pasteur, 1885). The vaccine has undergone several developments as cited by Ogunkoya (1979).The Avianized vaccine (Koprowsky and Cox, 1968) and the Tissue Cell Culture vaccine by Fenje (1960). The Modified Live Virus Vaccine-LEP produced in Nigeria in 1956 for dogs and the HEP for cats in 1970 (Ogboegbulem, 1994; Lamorde, 1981). The immunogenic potency and duration of immunity of the LEP CEO was found to be higher and longer (39 months) than any other rabies vaccine in dogs (Sikes, *et al.*, 1971).

By 1930, it was suspected that the rabies vaccines in use then were lacking in antigenicity and not proven until Webster (1939) demonstrated in laboratory mice that most of the commercial rabies vaccines used in dogs as well as man lacked antigenicity. Habel (1940) developed potency test to determine the immunogenic capacity of the vaccines. Tierkel, *et al.*, (1953) established that handling and injection routes affect immunogenic values of the vaccine. Strains of the vaccine appeared to change in the course of propagation using different animals and these methods were found to be no longer useful in vaccine production (Wiktor, *et al.*, 1969).

The problems of the MLV vaccine have been lack of immunogenic response in puppies less than 11 weeks old and encephalitis in puppies under 3 weeks of age (Steele, 1973); short shelf life (Dean, *et al.*, 1964); vaccine induced rabies in dogs (Cabasso, 1962; Kappus, 1976; Okoh, 1982, Ekele, *et al.*, 1984 and Ogboegbulem, 1984). The incidence of vaccine induced rabies and vaccine failures in MLV/CEO have been estimated at 3 cases in every million doses vaccinated (Bunn, 1984, 1984) and 2.5 per million doses in Nigeria (Ogboegbulem, 1994). These problems associated with MLV /CEO vaccine in dogs led to the withdrawal of the vaccine in most developed countries (Ogunkoya, 1997)

CASE HISTORY

Two five week old puppies from an Alsatian crossed bitch were presented to the Veterinary Clinic, FCAH&PT, NVRI, Vom Plateau State on 11th February, 2006. The client complained that the puppies were bitten by a stray dog the previous night being the 10th February, 2006. This is about 10months after the vaccination of the dam. The bitch was not present during the attach and has the following vaccination history.

Date of Vaccination	-	12 th April, 2005
Age	-	1 year 4 months
Type of vaccine	-	LEP (Flurry) CEO
Batch No.	-	2/2005
Expiring date	-	February, 2006
Producer	-	NVRI, Vom

Inoculation was done by reconstituting a dose in 2.5mls of distilled water and given deep nitra muscular in the thigh muscle.

DIAGNOSIS

Clinical examination of the puppies' revealed-body temperature was 38.7°C for the puppy that has bite on the head; 38.5°C for the one that sustained bites on the hind limbs.

The two puppies were quarantined in the clinic for observation as against earlier recommendation to destroy. The puppy that sustained injury on the head died on 27/2/06 and the head was decapitated and sent to Central Diagnostic Division NVRI, Vom for Laboratory test.

The second puppy manifested signs of rabies: paralysis of jaw, off-feeding avoiding people and paralysis of the hind limbs and died on 8/3/06. The head was also sent to the same laboratory.

The laboratory diagnostic results were as follows;

RD/34/2006 showed presence of Negri bodies on Sellers stain. The mouse inoculation test (MIT) became positive on 16th March, 2006 for the first puppy. The second puppy with No RD/43/2006 showed presence of Negri bodies on Sellers stain and was positive for MIT on 28th April, 2006.

DISCUSSION

The two puppies diagnosed for rabies died as a result of exposure to rabies at 5 weeks of age. The case history showed that the bitch was duly vaccinated. Factors likely to affect the immune response to the vaccine adversely were such as health status of the bitch, the handling and the cold chain (Ogunkoya, 1997) were taken care of. The antibodies level in the bitch was not assayed in the laboratory to ascertain the success of the immunogenic response. However, the *in vivo* assessment by the expected protection on the puppies to the challenge is more practical. The maternal antibody transfer is mainly through the blood in the neonate and in colostrums in the first 36 to 48 hours after birth. The antibody protection can be 5-6 weeks in puppies with low antibody titer and up to three months in puppies with high level. Factors that can affect maternal antibody transfer to the puppies include the initial level in the dam, the health and intake of colostrums by the puppies. That the puppies succumbed to the disease at this age means they most probably did not get enough maternal antibodies from the dam. The window of susceptibility (WOS) which is the period when the antibodies from the dam are too low to protect but too high for the vaccine to work would have come into play. The WOS period in puppies is highly dependant on the antibody titre in the dam which in turn is directly related to the anti-genicity of the vaccine used. The bitch was not aged as she was just under 2 years old, neither was it sick at the time of vaccination. The age at which the puppies were exposed (5 week) is

still a good period for any maternal antibodies to have been present to protect them, since the vaccine is said to protect the vaccinated dog for up to three (3) years (Ogunkoya, 1997). However, the decay rate of the maternal antibodies in this group needs to be investigated.

The present case appears to support the wide claim of vaccine failure in dogs reported in Nigeria (Babode, 1981; Okoh, 1982 and Ogboebulem, 1997) as the puppies from the vaccinated bitch were not protected. It could also be one of the 2.5 cases out of a million vaccinated cases that result in vaccine failure (Ogboebulem, 1994).

The 9 days time interval between the incubation periods in the two puppies has direct correlation with the proximity of the site of bite to the brain; the closer the site the shorter the period. Rabies has been reported in puppies 8 weeks old (Adeyanju, *et al.*, 1997) and 6 weeks old (Onunkwo, *et al.*, 1980) where no vaccination history of the bitches were available and many other unreported cases in Nigeria. The former authors have suggested a review of the vaccination schedule for dogs.

The average costs of rabies vaccination range from N200 to N500 per dog while that of post exposure treatment using the vaccine alone in humans is from N1,800 to N2, 200 per dose for 5 doses. The time, travel inconveniences and cost, plus other antibiotic treatments that go along make it more costly to treat than to vaccinate dogs. The vaccination schedules for puppies need to be reviewed to safeguard this age group of dogs. Vaccination in rabies control is not an option it should be the rule in Nigeria and therefore should be enforced.

RECOMMENDATIONS

1. The need to revisit the earlier steps to control rabies in dogs which include the production of HEP to carter for puppies less than three months.
2. The law on control of rabies in dogs by vaccination and elimination of stray dogs should be enforced.
3. A review of the vaccination schedule in dogs should be considered as a matter of necessity.
4. There should be continuous monitoring of the potency of the indigenous vaccine for use in dogs.
5. It is also advisable to adopt sero-monitor both in vaccinated and yet to be vaccinate (e.g puppies) in order to know the specific period of vaccinate dogs in Nigeria

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