

REPORT ON 2 CASES OF NEUROPARALYSIS IN DOGS AFTER ANTIRABIC VACCINATION*

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Before 1928 post-antirabic neuroparalysis was thought to be due to 1. modification of the street or fixed rabies virus 2. plurality of rabies virus 3. rabies toxin 4. the activation of some other neurotropic viruses and/or toxin lying latent in the body 5. anaphylaxis 6. neuro-allergy. From 1928 up to the present, neuro-allergy has been more and more considered as the cause of neuroparalysis.

The reasons for ascribing neuroparalysis to neuro-allergy can be summed up as follows: 1. Vaccines containing definitely killed virus may still cause neuroparalysis 2. No Negri bodies nor rabies virus can be demonstrated in the brains of animals having manifested neuroparalysis. 3. Normal brain tissue, either homologous or heterologous, when injected may result in neuroparalysis. 4. Neuroparalysis may be described immunologically as neuro-allergic phenomenon.

Neuroparalysis and paralysis due to rabies are absolutely distinct. Cases which die after antirabic vaccination showing paralysis and in which Negri bodies can be demonstrated and/or the presence of rabies virus proved by intracerebral mouse test are attributed to rabies (not neuro-paralysis), the antirabic vaccination having failed to confer an immunity.

Neuroparalysis at present is thought to be due to one or more "neuro-allergic factors" in the normal constituent of the nerve. The exact nature of the neuro-allergic factors is not yet completely understood at present. However, neuroparalysis has been experimentally produced by myelin, phosphatid fraction and protein fraction of the nerve. The neuro-allergic factor is found to be potentiated in the presence of adjuvants (paraffin oil, tubercle bacilli extract etc). Malnutrition may also increase the severity of the reactions. Changes in the myelin sheath of the nerves, demyelination or demyelination are the characteristic features.

Neuro-paralysis in man was first recorded by Laveran in 1891 and by many other authors since then. The following types in man are at present summarized:

1. Acute general reaction, including rash, can be alleviated by adrenaline injections.

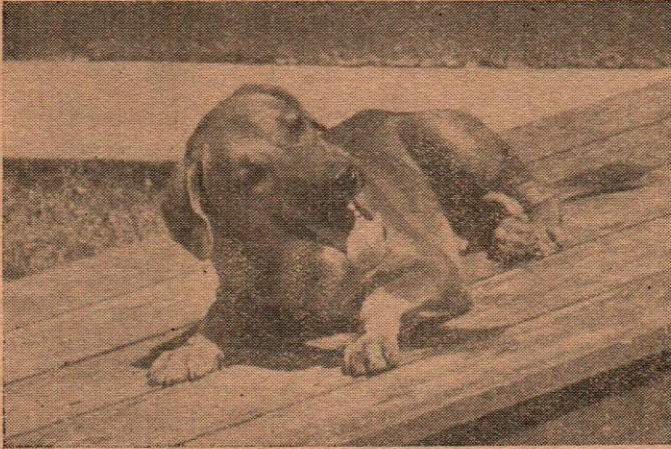
2. Delayed local reaction, usually manifesting itself seven or eight days after vaccination as a harmless swelling and reddening of the skin at the site of injection.

3. Severe delayed reaction, starting usually after seven or eight injections in the form of headache, fever, nausea,

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Neuro - paralytic accident ^{after} antirabic vaccination

อัมพาตเนื่องจากวัคซีนป้องกันสุนัขบ้า



(รายที่ ๒) Case 2

(ก่อนทำลาย) Just before being destroyed



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swollen lymph nodes, and, if injections are continued, complicated by neuritis, paralysis and encephalomyelitis.

4. Peripheral neuritis, usually occurring at the end of the series of injections and accompanied by fever. In rare cases the optic nerve is involved.

5. Dorso-lumbar transverse myelitis, beginning usually after the 10th injections up to a week after the completion of the vaccination, characterized by fever, weakness, numbness and tingling of the extremities, paralysis of the legs and anal sphincter, and unless the vaccinations are stopped at once, leading to severer conditions and death in 5% of the cases.

6. Ascending paralysis of the Landry type, starting after the 5-10th injection or any time until two weeks after the last injection. Its characteristics are headache, nausea, vomiting, girdle pain, incontinence of urine and ascending paralysis of the extremities. If the paralysis involves the bulbar nuclei death may intervene due to cardio-respiratory complications. While it is more rarely encountered than Type 5, its death rate is much higher (30-50%).

Neuroparalysis in animals was first recorded by Plantureux in 1926 and by other authors since then. It usually corresponds to the dorso-lumbar transverse myelitis type or the ascending paralysis of the Landry type. Other forms have not been observed. Pathological changes are similar to those in man consisting in perivascular and perineural cuffing, de-

myelination and degeneration of the axis cylinder.

In Thailand no report has ever been made of neuro-paralysis in animals. Perhaps, the high quality of the vaccine prepared by the Saovabha Institute (Siamese Red Cross) accounts for the rareness of such reactions. The observation of neuroparalysis in two dogs treated with antirabic vaccine ordered from the Pasteur Institute in Nhatrang, Indo China, seems therefore to be of interest.

Case 1

A female black and tan Dobermann-Pinscher, 1½ yrs old., about 20 Kg. body weight, owned by M.C. Kolith Kitiyakara. Previous History: on March 31st, 1950, the dog was in good health and received 10 cc. antirabic vaccine (ref. 78), subcutaneously.

Present illness: On April 10th, 1950, the owner complained that the dog was not playful as usual, hiding in the dark, showing salivation and marked anorexia.

Physical examination:

Skin: normal, no unusual odor, swelling at the site of vaccination, size about a pigeonegg, rather fixed, indurated and cold, not painful when touched or pressed.

Eye: sick expression, no discharge, conjunctiva normal, no evidence of anemia or jaundice.

Superficial lymph glands: not enlarged.

Paw: no hardening of foot pad.

Temperature: 102 F.

Owner's obedience test: positive but rather slow due to mental depression.

Circulatory system: Palpation - the position of the apex beat was normal.
Percussion - zone of cardiac dullness was normal.

Auscultation - no cardiac murmurs.

Pulse - full & strong 80/min.

Respiratory system: No nasal discharge, no cough, submaxillary lymph gland normal, voice not changed, normal respiration 20/min.

Palpation - no heat, pain, swelling in the thoracic region.

Percussion - area of thoracic dullness normal.

Auscultation - no rales.

Digestive system: Marked anorexia, no signs of suffocation when drinking; buccal cavity, pharynx normal, no vomiting. The abdomen was normal upon palpation and percussion, no gas or palpable mass. Rectal examination: no obstruction, stool normal in consistency and color; spleen and liver palpable.

Urinary system: urine passed normally, no evidence of pain, both kidneys palpable.

Reproductive system: normal as in the dioestrous period.

Nervous system: Psychic function disturbed, bite when another dog comes to play with her. Sensibility normal. Mobility normal. No spasm, no paralysis; reflex of eye lids, scratch and kneejerk positive. Visual and hearing still good.

Haematological examination: not made.

Urological examination: not made.

Tentative diagnosis: postantirabic neuro-paralysis.

Treatment:

Apr., 10,50 : 10 cc. calcium gluconate and 100 mg. vitamin B₁ intravenously.

Apr., 14,50 : The condition was not improved.

Treatment was thus formulated as follows:

10 cc. calcium gluconate intravenously daily.

100 mg. vitamin B₁ intravenously daily.

50 mg. vitamin B₆ intramuscularly daily.

2 cc. Hepastap forte (Conc. liver extract) daily.

15 cc. Sodium salicylate mixture orally thrice daily.

Apr., 16,50 : The condition was improved in both temperament and appetite, photophobia was still present.

Apr., 18,50 : The condition was markedly improved.

Apr., 20,50 : Normal in every respect except the indurated lump was reduced and attained the size of an engorged adult female tick.

Treatment was discontinued.

Owing to the presence of neuro-paralysis, the second injection recommended by the direction on the antirabic leaflet was not repeated.

(The dose of 5 c.c. was then given to an adult male Dachshund. No complications were observed after vaccination up to the 4th week).

May, 15,50 : A visit was made. No local swelling at the site of injection was

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palpable. She was completely recovered, healthy and well upon physical re-examination.

Case 2.

A male mongrel dog about 1 1/2 yrs. old. owned by Mrs. Boeles.

Previous history :

May, 24, 50: Healthy and well, 7-8 cc. antirabic vaccine Ref. 78. given subcutaneously by the hospital staff.

June, 14, 50: Healthy and well. Repeat the same dose as directed by the direction on the antirabic leaflet.

Present illness :

June, 24, 50: Nervous, circling to the left, weakness of the hind-quarters.

July, 4, 50: Aggravation of symptoms, paralysis of both hind legs. The staff of the hospital section gave unfavourable prognosis and suggested to the owner to destroy in order to exclude the rabies and brain tumours. This case was thus handed over to the author.

The previous history was then further asked from the hospital staff who attended the case and the record was summarized as follows: No nausea, vomiting, fever, girdle pain and swelling of the palpable lymph glands. Marked salivation, slight knee jerk, food and water taken in small amount. Normal urination, no sign of excitement but very nervous when touched, did not bite when a stick was introduced, good, memory towards the owner. No history of distemper or paradistemper. From

May 24 to June 4, 50, no nasal and ocular discharges. No hardening of foot pads. Very marked emaciation. The animal was then destroyed. Neuro-paralysis was suspected by the author.

Autopsy report :

1. Brain slightly oedematous, No tumours found.

2. Impression smear technique for Negri bodies—negative.

3. Intracerebral mouse test: 0.03 cc. of brain suspension intracerebrally injected into 5 mice, 1 died on the 15th day after injection probably due to accident. No Negri bodies found in the mouse's brain by the impression technique. 4 were normal up to the 30th day after injection.

4. Histopathology: No inclusions found.

Brain and meninges showed oedema congestion and infiltration with small round cells. A slight degree of demyelination occurred around degenerated and necrotic ganglion cells of the cerebral cortex and perivascularly. Purkinje cells of the cerebellum also showed ~~serve~~ *nerve* changes. Perivascular cuffing and sclerosis also appeared in places.

Impression: Postvaccination encephalitis.

5. The same lot of antirabic vaccine left in the refrigerator was then injected subcutaneously to a mongrel dog as follows:

July, 4, 50: 10 cc. antirabic vaccine subcutaneously.

July 25, 50: 8 cc. antirabic vaccine subcutaneously.

Aug. 20, 50: 11 cc. antirabic vaccine subcutaneously.

The dog's condition was quite normal in every respect up to September 5, 50. It was then destroyed as a subject during experimental pharmacology.

Discussion

Neuro-paralysis of 2 canine cases were diagnosed as post-antirabic accident.

The first case should be classified as peripheral neuritis of the optic nerve with local reaction which was not found in literature and apparently different from dorso-lumbar transverse myelitis and ascending paralysis of the Landry type.

The second case might perhaps be classified as similar to the ascending paralysis of the Landry type in man although the clinical symptoms were not quite characteristic.

The use of 100 ampuls of antirabic vaccine (Pasteur Institute, Nhatrang) caused 3 neuroparalysis (another case was later reported by the hospital staff), 2 cases recovered satisfactorily, one was destroyed in extremis.

The therapeutic use of antihistaminics, vitamin B₁, B₆, salicylates and calcium quicken the restoration of the animal health to normal.

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โรงงานผลิตแข็ง

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