NOTE  Internal Medicine

A Case of Shaker Dog Disease in a Miniature Dachshund

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ABSTRACT. A male miniature Dachshund, twenty-two months of age, was referred with paroxysmal generalized tremors as a main clinical sign. There were no abnormalities in the neurological examination except the lack of bilateral menace responses, and in the magnetic resonance imaging of its brain. Analysis of cerebro-spinal fluid revealed a slight rise in protein concentration and an increase in the number of cells. This case with brown hair was diagnosed as the shaker dog disease, which has also been well known as “little white shakers” syndrome due to being found in small dogs with white hair, because the clinical signs were exactly analogous to the shaker dog disease, and the generalized tremors disappeared on the first day after the administration of prednisolone and diazepam.

KEY WORDS: canine, generalized tremors.

Generalized tremor seems to be caused by hypomyelination such as hypomyelinosogenesis in the spinal cord and the brain, toxicosis of organic phosphorus compound, degenerative neurological diseases such as storage disease and spongiform encephalopathy, or idiopathic generalized tremor syndromes such as “little white shakers” syndrome (LWSS). LWSS occurs from 5 months to 3 years old of age in both genders and the tremor maintains and spreads to the whole body [1, 4, 5]. The clinical sign worsens day by day and improves with administrations of corticosteroids and/or benzodiazepines. Originally, LWSS was reported in the white haired small dogs such as Malteses and West highland white terriers, from which the name of LWSS came. Recently, LWSS has been recognized in any sized and hair-colored dogs such as Shih tzu dogs, beagles, Yorkshire terriers, Australian silky terriers and miniature pinscher dogs [1, 4, 5]. Now, the term of “shaker dog disease” has been used as a synonym of LWSS and this disease includes idiopathic tremors of adult dogs and sporadic acquired tremors of adult dogs [2]. The disease has been observed only in the United States and Australia until 2001. In Japan, two suspected cases of LWSS in the Maltese have been presented by Morozumi and others [3], but there has been no report on shaker dog disease with generalized tremors in the hair-colored dog.

This case was a male miniature Dachshund, twenty-two months of age, and referred to the Animal Medical Center, Nihon University, with paroxysmal generalized tremors. Body weight was 4.2 kg and its hair was brown. History: he started shivering 10 days ago and was given a high dose of phenobarbital. Therefore, on the first visit day, serum phenobarbital concentration was 53.4 µg/ml. The physical examination revealed a body temperature of 40.5°C and a heart rate of 102 beats/min. This case had the normal sized lymph nodes and no disturbance of consciousness, but had generalized tremors as well as panting. In addition, intention tremors were observed when the dog started to eat or was held with human hands. Its gait was unsteady and it tended to fall over. The neurological examination revealed a lack of bilateral menace responses. The complete blood cell count and the blood chemistry profile showed no abnormality.

Because central neurological disease was suspected, the magnetic resonance (MR) imaging of the brain and sampling of cerebro-spinal fluid (CSF) were performed. MR images were obtained with a 0.5-T FLEXART (Toshiba, Tokyo, Japan). T1-weighted, T2-weighted and fluid-attenuated inversion recovery MR images revealed no abnormality in the brain. The CSF profile is shown in Table 1. The concentration of protein in CSF slightly increased and the Pandy reaction was positive, but antibody of canine distemper virus was not detected.

From these results, this case was diagnosed provisionally as a similar disease to shaker dog disease. Then, according to the method of Parker [4], treatment with prednisolone 2 mg/kg, SID, PO and diazepam 1 mg/kg, TID, PO started on the first day of its admission to our hospital. The tremor became mild on the second day, disappeared from its extremities in the resting period on the 4th day and completely from all of the body in any condition on the 5th day. The neurological examination demonstrated the normalization of bilateral menace responses on the examination day, two weeks after its treatment, and any clinical signs disappeared on the examination day 4 weeks after that.

Wagner and others reported about 24 dogs with general-

Table 1. CSF profile

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<table>
<thead>
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<tbody>
<tr>
<td>Protein</td>
<td>44 mg/dl</td>
</tr>
<tr>
<td>Pandy reaction</td>
<td>1+</td>
</tr>
<tr>
<td>Cells</td>
<td>68 cells/µl</td>
</tr>
<tr>
<td>Differential</td>
<td>L:29, N: 39 cells</td>
</tr>
<tr>
<td>CDV IP antibody</td>
<td>under 10 titters</td>
</tr>
<tr>
<td>Bacteria</td>
<td>negative</td>
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</tbody>
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L: lymphocyte, N: neutrophil.
ized tremors, in which they used the term steroid responsive tremor syndrome (SRTS) for cases that were young adults under 15 kg body weight with any color of hair and were controlled by corticosteroid therapy [6]. Furthermore, SRTS was divided into the inflammatory group and the idiopathic one in which LWSS was included, according to the number of cells and the concentration of protein in CSF. The former had higher values of those than the later. The inflammatory group had a number of cells of averaging 16 (4–40) cells/µl and the concentration of protein averaged 24.3 (13–46) mg/dl. On the other hand, the idiopathic group averaged 3 cells/µl and 16 mg/dl, respectively. They recommended the therapy with corticosteroid for cases with generalized tremors, if the case was a young adult dog under 15 kg body weight with any colored hair, and then toxicosis and infectious diseases were ruled out.

Our case had no history indicating the possibility of having taken any toxic substances. Both neutralizing and IP antibody titers of canine distemper virus in serum and CSF were under the measurable range. The number of cells (68 cells/µl) and the concentration of protein (44 mg/dl) in CSF were slightly high. These results indicated that the toxicosis or an infectious disease might be ruled out in this case. In addition, MR images did not reveal any inflammatory signs, cyst, bleeding or tumor in the brain, but this was suspected as the unknown inflammatory disease because of the slightly higher concentration of protein and the increased number of cells than the normal range as well as positive Pandy reaction in CSF. Bagley and others also speculated that the generalized tremors in Malteses was the inflammatory brain disease because of a mild to severe lymphocytic pleocytosis (9–282 cells/µl) demonstrated by CSF analysis and electroencephalographic abnormalities of high-amplitude low-frequency activity and normal-amplitude low-frequency activity [1]. The number of cells in CSF in our case was higher than the maximum values in Wagner’s cases [6] and much lower than those in Bagley’s cases [1]. These differences in the number of cells in CSF might result from the different phase of the inflammatory process, although there has been no report to have proven that.

The case responded well to the combination therapy of corticosteroid and diazepam. In SRTS cases of Wagner and others, 7 of 11 dogs in the inflammatory group and 1 of 11 dogs in the idiopathic group were given the combination therapy of corticosteroid and benzodiazepine to control the generalized tremors [6]. Therefore, the tremor of SRTS, that Wagner and others reported, may have not been controlled by corticosteroid only and the term “SRTS” may not be suitable for most canine cases with the generalized tremors. Because our case was treated with the combination therapy of prednisolone and diazepam, we were not able to define which medication had had the main effect on this case. We should have administered either benzodiazepine or corticosteroid at first to determine whether the case was SRTS or not.

In summary, it was speculated that the diagnosis of this case was the shaker dog disease. We adopted this term the shaker dog disease in place of LWSS, as his hair had colored. This report is the first case of the shaker dog disease in a hair-colored dog in Japan.

REFERENCES