Gastric dilatation-volvulus cases in military working dogs. A retrospective study

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Abstract: This article is a review about gastric dilatation-volvulus syndrome (GDV) which is a life-threatening condition and cause of death in dogs. The aim of the study is twofold, to present all the new international data concerning this syndrome and also to analyze 22 GDV cases in military working dogs. The records of all military working dogs that died were evaluated by review of necropsy and histopathology reports, death certificates, and daily clinical treatment sheets. The cases were divided into two groups: In the first group deaths happened suddenly at the place of work for the dog. In the second group dogs were evacuated to hospital in time and due to the efforts of the veterinary staffs many of them survive after surgery. GDV syndrome is syndrome that has to be investigated continuously and veterinarians should undertake nutritional and medical measures.

Key words: military working dogs, gastric dilatation-volvulus

Gastric dilatation-volvulus (GDV) is a life-threatening condition in dogs and other species in which the stomach dilates and rotates on itself. The etiology of the disease is multi-factorial, but explicit precipitating causes are unknown.

The aim of the present study was to describe GDV which is the most frequent syndrome in military working dogs (MWD) and causes sudden deaths among MWDs. GDV have been reported in many papers because it shortens a MWD’s utility and longevity and should be recognized in time in order to permit the implementation of preventive medicine and management to develop the endurance of the dogs¹-⁶.

The Training and Medical Veterinary Center (KENOK) is responsible for “Role 2” and “Role 3” veterinary support to the 227 working dogs which served in the armed forces, the police, the special forces of the fire brigade and the coast guards. These dogs provide force-protection support in security and contraband detection of explosives and narcotics. Frequently, working dogs with GDV are evacuated to TMVC’s clinic dead or alive but with very guarded prognosis. The development and evolution of these incidents are usually related to the severity of the case, the duration of evacuation and finally, the capabilities of veterinary staff and infrastructure of the hospital. Unfortunately, despite the efforts made to ensure survival, restitution and maintenance of the dogs’ operational capability, in many cases the patient dog died. Also, some dogs died suddenly in their working place or post surgically after a short time of hospitalization.

Materials and Methods:

The material of work was compiled from a review of 22 sexually intact male German Shepherds dogs. Ten of the dogs served in the Land Forces and 10 dogs served in the Air Force. The ages of the dead animals varied (Table 1). The conditions of living and the preventive veterinary support were the same in for all dogs. The animals were fed with balanced...
commercial foodstuffs, while they were simultaneously having free access to water. Records for the dogs of this study were reviewed for the period January 1998 to December 2005. All cases were evacuated straightaway, taking approximately 45 minutes from the time that the incident was spotted, to arrival in hospital.

Table 1. Ages of dead MWDs in years 1998 to 2005.

<table>
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<tr>
<th>Cases/Years</th>
<th>1998</th>
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<td>6.3</td>
<td>8.4</td>
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<td>6.8</td>
<td>6.8</td>
<td>11.5</td>
<td>11.5</td>
<td>12.1*</td>
<td>13*</td>
<td>10</td>
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<td>3</td>
<td>10.8</td>
<td>10.9</td>
<td>4.5</td>
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</table>

*Dogs veterans

Figure 1. Mortality rates between 1998 and 2005.

Results:

From the total of 22 dogs, 17 animals were transferred to the hospital in a deceased state (77.27%). The sudden death happened in their kennels. No death happened on duty. In 14 cases (63.63%) the death was confirmed between 24:00 and 06:00 hours. Median age at death was 9.16 years and the range was from 2.2 to 13 years. (Table 1)

After their arrival in hospital, necropsy was immediately performed in all 17 cases. The causes of death and mortality rates were determined after evaluation of the recorded clinical signs, death certificate, gross necropsy findings and histopathology reports (Fig 1). Typical findings belonged to GDV or its complications.

The other five cases were evacuated urgently from their units to hospital. A thorough clinical examination was conducted immediately. Also haematological, biochemical, radiological and ultrasound examinations were performed. The dogs were decompressed with intubation of stomach and immediate surgery was performed to reposition and evaluate the condition of stomach’s wall. In all five cases, part of the stomach wall has necrosed and was re-
sected. The spleen did not sustain damage and was not removed. To prevent the stomach from twisting again in the future gastropexy was performed.

Discussion:

The GDV can affect many species including man, but is of particular concern in dogs due to its frequency. This syndrome is the most frequent cause of sudden death in German Shepherds. Vascular compromise can result in stomach wall necrosis, shock and death, with mortality rates ranging from 23% to 60%. This percentage is almost three times higher than the mortality rate reported for civilian-owned German Shepherd dogs and military dogs of similar breeds.

The physical mechanisms of this disease in dogs are well understood although the etiology is not. A multiplicity of risk factors have been proposed: temperament (excitability) of the dog, large and giant breed, increased thoracic depth-to-width ratio and rapid food consumption, as well as the consumption of large volumes of food. In GDV cases, the stomach is distended with gas and aerophagia, fermentation-putrefaction, chemical gas genesis and gas diffusion have been suggested as sources of this gas. Bacterial metabolism, presumably related to Clostridia organisms, could result in liberation of CO₂, CH₄, and H₂, but stomach gas analysis in previous papers determined concentrations similar to atmospheric air. Veterinarians have hypothesized that there is an association between GDV and weather conditions shortly before its occurrence but did not find a statistically significant association between incidence of GDV and meteorological conditions. Behaviorists contend that dogs can sense oncoming storms, and a change in barometric pressure is hypothesized to be a biometeorological trigger evoking a change in the dog’s behavior. In humans, an association has been found between changes in barometric pressure and the onset of labor and sudden infant death syndrome.

It should be stated that the impotence of surgical treatment to the above syndrome is mainly due to the fact that the syndrome is acute in onset and usually happens during the night amongst dogs out of service. Thus, it is difficult to detect by the dogs handler. Due to these factors, there was a delay in evacuation of the patient dog. This condition can be prevented by controlling the risk factors, as described in international literature. In particular, the use of two dinners per day and the limitation of kinetic activity immediately after the consumption of food are considered correct prophylactic measures. Although these risk factors were checked, they failed to restrict the death rate. This observation supports the opinions that in the etiology of the syndrome, physiologic and behavioral factors are also involved. Both temperament and age have been correlated with an increased risk of GDV. According to the history of the cases, those animals that died from GDV presented a quite nervous and aggressive character. Also their death happened on a day that their handler was off-duty and so they reacted even more anxiously. Living conditions for the animals may potentially relate to the appearance of the syndrome. The syndrome appeared to be present only in dogs belonging to the armed forces, where dogs were kept in caged facilities measuring 5 to 6 m².

Conclusion:

In accordance with international bibliography, MWDs are more susceptible to specific diseases and syndromes. This happens because of the inherited prevalence to certain diseases in particular breeds of dog. Also, it can be attributed to the daily working program and the psychism of these dogs. Undoubtedly, prophylactic measures for GDV are the only way to limit the prevalence of the syndrome. Military veterinarians should undertake nutritional, medical and management measures that will reduce the prevalence and fatality rate of GDV syndrome. Finally, information provided by this study may help military veterinarians to determine the prognosis for working dogs in relation to the aforementioned disease.
References:


