The Pharma Innovation Journal 2022; SP-11(10): 830-832

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; SP-11(10): 830-832

www.thepharmajournal.com
Received: 22-08-2022
Accepted: 26-09-2022

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Organophosphorus compound poisoning post mortem findings in a dog and its veterolegal approach

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Abstract
A Non- descriptive canine male dog of 5month old was presented with sudden death. Owner reported that dog had doubtful death. The post mortem was conducted in the dead dog for assessing the cause of death. The condition of the dog is emaciated. Rigor mortis was absent. The visible mucous membrane was pale. The important lesion was bloody discharge from anal opening. The liver is congested and yellow patches were present in the liver.
Ecchymotic haemorrhages were found all along the intestines. Since there is no signs of traumatic injury and no history of disease symptoms. The cause of death is suspected for poisoning based on the postmortem findings. So the dog viscera like liver, kidney, heart, spleen, lungs, stomach with digested contents and intestinal loop were collected. The collected samples was labelled and sealed before owner and other competent authority. The samples were sent to forensic science laboratory by competent authority.
The report by forensic science laboratory revealed that liver, kidney, heart, lungs, stomach and intestine was detected with organophosphorus compound while the preservative sent as control was not detected for organophosphorus or any other poison. The report made a note that organophosphorus compounds are poisonous and used as insecticide. Hence it is evident that the death of dog is due to respiratory failure and shock caused by organophosphorus compounds poisoning.

Keywords: Organophosphorus poisoning, organophosphorus post mortem lesions in dog, veterolegal approach for poisoning suspected cases

Introduction
Organophosphates (OP) and carbamates are commonly used insecticides and important intoxication sources of humans and animals (Klainbart *et al*., 2019) [3]. Organophosphorus compounds (OP) are organic compounds containing phosphorus in a combination which permits them to competitively inhibit cholinesterases (ChEs) and possibly other esterases. They are widely used in animals, plants and in the soil as insecticides, acaricides and anthelmintics (Abdelsalam, 1987) [1].
The most common presenting clinical signs of OPC toxicity include muscle tremor, hypersalivation, miosis, weakness, vomiting and diarrhea (Klainbart *et al*., 2019) [3]. Organophosphorus compounds exert their toxic action by competitive inhibition of cholinesterases with consequent accumulation of acetylcholine (Ach) at the neuromuscular junctions, autonomic ganglia and effector junctions (Koelie & Gilman, 1949; Holmstedt, 1959; O'Brian, 1960) [4, 2]. Post mortem examination revealed severe lungs, liver and stomach congestion. Multifocal areas of necrosis in the liver and kidney, serosal and mucosal haemorrhages and haemorrhagic meningitis were also observed. (Ola-Davies *et al*., 2018) [6]

Case history
A Non- descriptive canine male dog of 5month old was presented with sudden death. Owner reported that dog had doubtful death. He wants to know the reason for dogs death. Owner presented the report from competent authority demanding veterolegal investigation. Postmortem was done in dead dog for revealing the cause of death.

Postmortem findings
The post mortem was conducted in the dead dog for assessing the cause of death. The condition of the dog is emaciated. Rigor mortis was absent. The visible mucous membrane was pale as presented in the figure 1. The important lesion was bloody discharge with faeces from anal opening as presented in figure 2. Further the pulmonary edema was present in the

lungs and pulmonary cavity. The heart contains the clotted blood in all four chambers. Splenomegaly was noticed. The liver is congested and yellow patches were present in the liver as presented in the figure 3.

Ecchymotic haemorrhages were found all along the intestines. Since there is no signs of traumatic injury and no history of disease symptoms. The cause of death is suspected for poisoning based on the postmortem findings. So the dog viscera like liver, kidney, heart, spleen, lungs, stomach with digested contents and intestinal loop were fully immersed in glass containers along with saturated salt solution. Importance should be given that same amount of saturated salt solution (preservative) to be submitted as control along with the viscera samples. The collected samples was labelled and sealed before owner and other competent authority. The samples were sent to forensic science laboratory by competent authority.

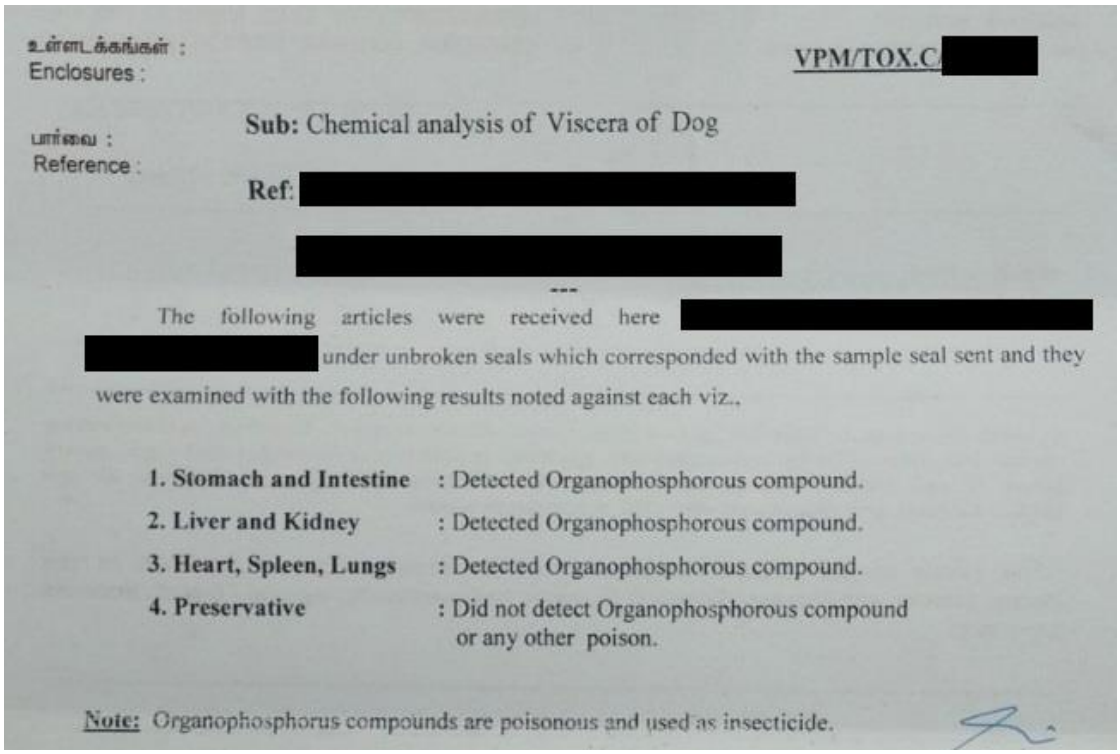
Fig 1: Pale mucous membrane

Fig 2: Bloody discharge from anus

Fig 3: Yellow patches in liver

Results and Discussion

The samples of dog viscera sent to forensic science laboratory for chemical analysis. The report by forensic science laboratory revealed that liver, kidney, heart, lungs, stomach and intestine was detected with organophosphorus compound while the preservative sent as control was not detected for organophosphorus or any other poison. The lab report was presented in the figure 4. The report made a note that organophosphorus compounds are poisonous and used as insecticide. Hence it is evident that the death of dog is due to respiratory failure and shock caused by organophosphorus compounds poisoning.



உள்ளடக்கங்கள் :
Enclosures :

VPM/TOX.C[redacted]

பார்வை :
Reference :

Sub: Chemical analysis of Viscera of Dog

Ref: [redacted]

[redacted]

The following articles were received here [redacted] under unbroken seals which corresponded with the sample seal sent and they were examined with the following results noted against each viz.,

1. Stomach and Intestine	: Detected Organophosphorous compound.
2. Liver and Kidney	: Detected Organophosphorous compound.
3. Heart, Spleen, Lungs	: Detected Organophosphorous compound.
4. Preservative	: Did not detect Organophosphorous compound or any other poison.

Note: Organophosphorus compounds are poisonous and used as insecticide.

Fig 4: Lab report indicating the presence of OPC compounds in Dog viscera (some areas are shaded for veterolegal aspect)

Conclusion

Necropsy is the sole diagnostic technique available to veterinarian to find out the cause of death of the animals. If the case is suspected for toxic poisoning try to collect samples from all major organs and mention the type of poison in your report. This will help the police authorities to establish or confirm the type of toxin/poison in forensic Laboratory.

References

1. Abdelsalam EB. Organophosphorus compounds. I. Toxicity in domestic animals. Veterinary research communications. 1987;11(3):211-219.
2. Holmstedt B. Pharmacology of organophosphorus chotinesterase inhibitors. Pharmacot. 1959;2:567-699.
3. Klainbart S, Grabernik M, Kelmer E, Chai O, Cuneah O, Segev G, *et al*. Clinical manifestations, laboratory findings, treatment and outcome of acute organophosphate or carbamate intoxication in 102 dogs: A retrospective study. Veterinary journal (London, England: 1997), 2019;251:105349.
4. Koelle GB, Gilman A. Anticholinesterase drugs. Pharmaco L Rev.,i, 1949, 166-216.
5. O'Brien, RJD. Toxic phosphorus esters. (Academic Press, New York); c1960.
6. Ola-Davies OE, Azeez OI, Oyagbemi AA, Abatan MO. Acute coumaphos organophosphate exposure in the domestic dogs: Its implication on haematology and liver functions. International journal of veterinary science and medicine. 2018;6(1):103-112.