

Case Report

Gross Pathological Findings of Rabbit Hemorrhagic Disease (RHD) in Two (02) Cases

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ABSTRACT

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Laboratory animals like mice, rabbits, guinea pigs are the key experimental animals in research laboratories. This report is about the domestic angora rabbits which were kept at Animal Health Research Laboratories (AHRL), National Agricultural Research Centre (NARC) Islamabad for research purpose. Suddenly death occurred in two of rabbits. These rabbits were about ten (10) weeks of age. For proper diagnosis, necropsy was performed in two rabbits and this was diagnosed that these were died of Rabbit Hemorrhagic Disease (RHD) which is caused by a *Rabbit hemorrhagic disease virus* (RHDV); a member of genus *Lagovirus* from *Caliciviridae* family. The disease is first time reported in Pakistan in angora rabbits kept for research purpose.

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Historically Rabbit Hemorrhagic Disease (RHD) was first seen in commercially bred angora rabbits in 1984 in the Jiangsu Province of China (Liu et al., 1984). About 140 million domestic rabbits were killed by this disease (Liu et al., 1984; Xu, 1991). Next this disease was reported by Korea which actually imports rabbit fur from china (Park et al., 1987). In Europe, this disease was first reported in Italy in 1986 and from there it was spread throughout Europe and endemic in many countries (Cancellotti and Renzi, 1991). In Spain first outbreak of RHD was reported in 1988 (Argüello et al., 1988) and in Portugal in 1989 (Anonymous, 1989). At the same time North Africa faces several outbreaks of RHD (Morisseet al. 1991), however Mexico is the only country which successfully eradicated this disease. This success is correlated with the reduction of wild European rabbits from the country (Gregg et al, 1991). RHD has significant economic losses in meat and fur industry of rabbits as well as ecological losses to wild type rabbits (Xu WY, 1991; Gregg et al, 1991). Initially this virus was considered as picorna virus (An S-H., 1988) then a parvo virus (Gregg et al, 1989) and parvo-like virus (Xu et al, 1991) and finally it was classified in genus *Lagovirus* of *Caliciviridae* family (Meyers G, 1991; Moussa et al., 1992). *Rabbit hemorrhagic disease virus* (RHDV) has small size virion as compared to other caliciviruses which is about 35–40 nm diameter (Thouvenin et al., 1997; Valicek et al., 1990). The transmission of the disease is through oral, nasal, conjunctival and parenteral route. Blood feeding insects are also act as mechanical vector (Xu et al, 1989; Asgari et al., 1989) Transmission of RHDV occurs through direct contact with infected population as infected rabbits sheds virus in their secretions and excretions and the faecal-oral route is assumed to be the most important transmission method (Ohlinger et al., 1993). Mechanical vectors such as blood feeding insects are also possible route of transmission, e.g flies (Diptera: Calliphoridae) (Asgari et al., 1989). The incubation period of the disease ranges

between one to three days depending upon the stage of disease (Marcato et al., 1991; Xu et al, 1989). The disease has three stages per acute, acute and sub-acute. In per acute form infected animals died without showing any clinical signs and in acute form of the disease anorexia, congestion of conjunctiva and neurological signs like excitement, opisthotonos, paralysis and ataxia may also observed in infected animals and sometime respiratory signs are also be observed. Lacrimation, ocular haemorrhages and epistaxis can also occur. In sub-acute form of the disease similar signs are observed but with mild appearance (Patton, 1989). In case of an outbreak low percentage of chronic form of RHD was observed which may show anorexia, jaundice and lethargy (Capucci et al, 1991). Spleen and liver are the primary target sites for RHDV replication and in most of the cases acute hepatitis is seen (Alonso et al., 1998; Park et al, 1995).

National Institute of Health (NIH), Islamabad imported angora rabbits from Nepal for research purpose. A total of fifteen (15) angora rabbits which were brought up from National Institute of Health (NIH), Islamabad on May 1, 2013 to Animal Health Research Laboratories (AHRL) for research purpose. All rabbits were healthy and active showing no any clinical illness. On May 8, 2013 the attendant of Animal House at Animal Health Research Laboratories reported that two (02) rabbits were dead without showing any clinical signs and no any external lesions were seen by the attendant. Others healthy rabbits were immediately separated from dead animals. He kept them in freezer at -20 °C for postmortem examination. Next day postmortem was conducted by the experts at AHRL for diagnosis of the disease.

Both the legs of the rabbits were straight and head over neck, body coat was ruffled with sticky anus. The eyelids were swollen and evidence of lacrimation was also there. After general examination the rabbits were open for visceral organ examination. Trachea contained bloody mucus and frothy

appearance. Lungs were hyperaemic. Heart showed many epicardial hemorrhages. Livers of both rabbits were enlarged and give yellow-grey coloration with hemorrhages. Gall bladders were filled with bile which was suggestive of anorexia

and fever. Enteritis of small intestine was also observed. Both the kidneys showed yellowish red spotted dark brown coloration and enlargement. Urinary bladders were filled with urine (Table-1).

Table 1: Gross Pathological lesions seen during necropsy

| Affected Organ | Lesions |
|-----------------|---|
| Trachea | Frothy appearance and bloody mucus |
| Lungs | Hyperaemia, perivascular haemorrhages |
| Heart | Multiple epicardial haemorrhages |
| Liver | Enlarged, yellow-grey color, haemorrhages |
| Spleen | Spotted dark red coloration |
| Small Intestine | Enteritis |
| Kidneys | Enlarged, deep red coloration, haemorrhages and dilated tubuli. |

The evidence of lacrimation on general appearance and yellow-grey coloration of liver, hemorrhages on liver and spotted dark coloration of kidneys is highly suggestive of Rabbit Hemorrhagic Disease (RHD) which is caused by a *Rabbit hemorrhagic disease virus* (RHDV) a member of genus *Lagovirus* from *Calciviridae* family.

RHDV outbreaks are still occurs on almost all continents which causes considerable mortalities in Rabbits. RHD endemic in most parts of Europe, Asia, and parts of Africa, Australia and New Zealand (Abrantes et al. 2012). This virus causes haemorrhages in different organs of the body and lead to death of the animal. For prevention and control active immunization showed less protection or short term protection from disease. While passive immunization in animals showing clinical signs is ineffective. Immunoprophylactic measures like vaccination and biosecurity are most important measures for prevention and control of the disease. The emergence of pathogenic form of RHDV is not clear yet and host parasite interaction between RHDV and European rabbits is still unknown. In order to understand the pathogenesis of the disease, efforts should be made for full genome sequence of non-pathogenic strains and sequence of pathogenic strains of RHDV (Abrantes et al. 2012).

CONFLICT OF INTEREST:

Authors have no any conflict of interests.

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