DOI Number: 10.37506/v14/i1/2020/ijfmt/193036

The Effects of Newcastle virus Histologically Suspension on Some Organs of White Mice (Balb /c)

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Abstract

Newcastle disease is a contagious bird disease affecting wild avian species and many domestic,it may be transmissible to humans. Detection of Newcasstle virus confirmed by rapid test technique(Immunochromatography) . ten sample (10%) out of 100 fasces sample collected from chickens were posative. Twelve mice used in this study devided into two groups ,first group consist of six mice induced with 0.2 ml from one positive sample of Newcasttle virus suspension to evaluate some histopathological changes caused by Newcasstle virus in small intestine and stomach of mice,second group induced with 0.2 ml from phosphate buffer saline only. The results revealed that histopathological changes in liver induced by using 0.2 ml from the positive Newcasstle virus suspension as hyperpalsia in kufper cells. Lung of mice treated with this concentration of Newcasstle virus has partial pnemonia and thicking the intra alveolar walls. While brain of mice treated with same concentration suffering from increase in number of glial cells (glialosis) and apoptosis in brain cells.

Key words: *Newcastle virus, histologically suspension*

Introduction

Newcastle disease is caused by avian paramyxovirus serotype-1 (APMV-1), which is also disease virus (NDV). It is a highly contagious viral diseases that affects domesticated and wild bird species throughout the world as well as NDV is a human pathogen and the most common sign of infection in humans is conjunctivitis that develops within hours of NDV exposure to the eye [(1,2)]) However, disease host species and in different geographical locations . NDV is classified in the genus Avulavirus within subfamilyParamyxovirinae, family Paramyxoviridae and order Mononegavirales [3] . This enveloped virus has a negative sense non-segmented, single stranded RNA genome has 15198 nucleotides in length [4] . The genome encodes six structural and two non-structural proteins Based on the fusion (F) gene strains are classified into lineages or genotypes; however the discrepancies between the two classification systems are nominal [(5,6,7).] NDV is spread primarily through direct contact between healthy birds and the bodily discharges of infected birds The disease is transmitted through infected birds' droppings and secretions from the nose, mouth, and eyes.. Clinical manifestation or severity of the ND depends largely upon the isolates involved in disease outbreak [8] . Based upon pathogenicity, these strains are commonly categorized into velogenic(mesogenic and lentogenic types [9] . The varying level of pathogenicity is attributed to amino acid sequence motif present in protease cleavage site of the precursor F protein[(10,11).]

Materials and Method

1-Samples collection:

A total of 100 faeces samples were collected from chicken suffering from clinical signs and symptoms of severe greeinsh watery diarrhea. Detection of Newcasstle virus performed by rapid test (Immunochromatography) supplied from Biochek company –USA . The positive samples for Newcasstle by rapid test were diluted with phosphate buffer saline or normal saline and stored at -20 ℃ in freeze . . One positive samples of Newcasstle was further used for the experimental study on laboratory animals (mice) for evaluation the effects of Newcasstle disease on histologicalsections of these mice.

2-Experimental study : A total of 12 males mice species Balb/c have aged two month and weight 100-120 g divided into two groups , the first group consist of six mice injected orally with 0.2ml of Newcasstle virus suspension for one positive sample.. The other as

control group was received 0.2 ml of sterile phosphate buffer saline (PBS) according to methods of [12,13]. after 4-6 days clinical signs were recorded in infected animals . were observed Experimental mice were sacrificed after anesthetization by chloroform and open abdomen cavity by medical scissors, tissue from small intestine , stomach ,liver were collected from the experimentally infected mice and placed in formalin 10% for histopathological examination in later. Histological sections and staining were prepared according to methods described by [14] . The histopathological changes were observed by Dr. Nemah . H. AL-jabori /college of medicine / Babylon university under the magnification power 10X and 40 X of light microscope.

Results

Histological changes of current study observed in liver , lung and brain of mice infected with 0.2ml from newcasstle virus suspension , these changes shown in figure1,3,5, while figures 2,4,6 represented control group of mice treated with 0.2ml phosphate buffer saline. In this results figure (1) represented the liver of mice treated with 0.2ml from Newcasstle virus suspension shows hyperpalsia in kufper cells. The results in figure (3) indicated to lungs of mice treated with 0.2ml concentration from virus Newcasstle suspension revealed to partial pnemonia and thicking the intra alveolar walls .While the figure (5) revealed to the brain of mice treated with 0.2ml concentration from newcasstle virus suspension revealed to increase in number of glial cells (glialosis) and apoptosis in brain cells. Finaly the figures 2,4,6 revealed to liver ,lung and brain respectively for control mice treated with phosphate buffer saline. No histological changes observed in liver ,lung and brain of control mice group

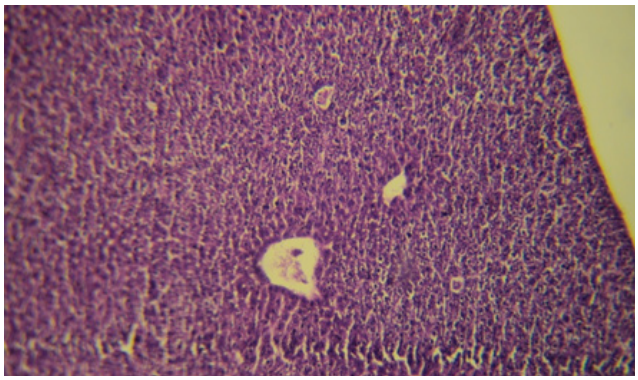

Figure (1) liver of mice treated with 0.2 ml of Newcasstle virus suspension . The slide shows hyperpalsia in kufper cells. H&E 20X

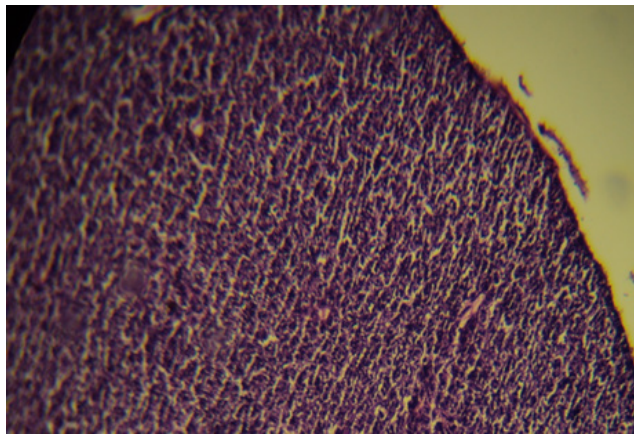

Figure (2) Control of liver mice treated with 0.2 ml phosphate buffer saline has normal hepatocytes . H&E 20X

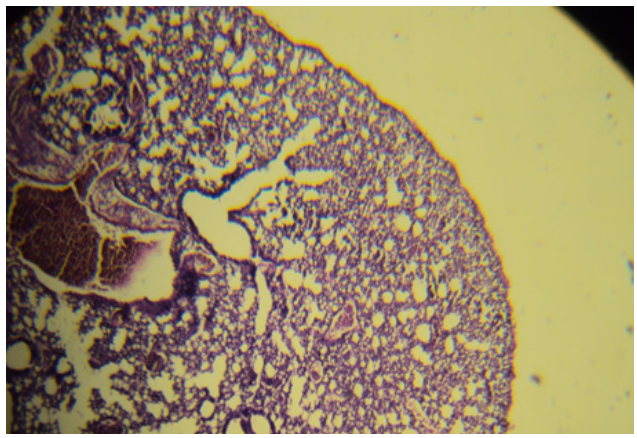

Figure (3) Lung of mice treated with 0.2 ml of Newcasstle virus suspension . The slide shows partial pnemonia and thicking the intra alveolar walls. H&E20X

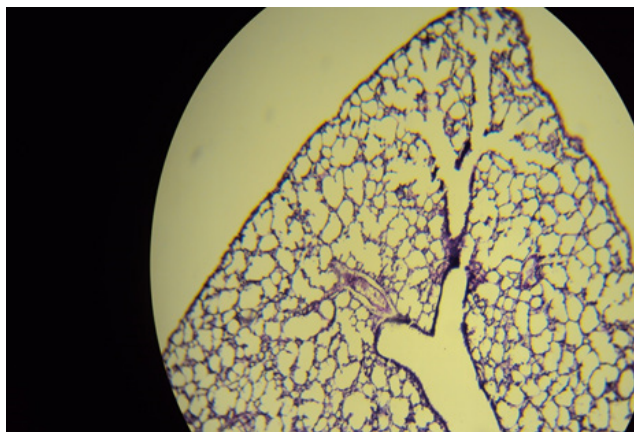

Figure (4). Control of lung mice treated with 0.2 ml phosphate buffer saline has normal intra alveolar walls . H&E 20X

Discussion

The authors consider lesions of Newcasstle virus most prominent duodenum jejunum and ileum. Even in birds showing neurological signs prior to death, little evidence is found nervous system. Lesions are usually present in the respiratory tract when clinical

signs indicate involvement [15] . The results of present study about effects of Newcasstle virus suspension on liver, lung, and brain of mice which experimentally infected revealed to histopathological changes within liver ,lung and brain of mice infected with 0.2ml from Newcasstle virus suspension .These histopathological changes were observed in figure1,3,5 . figure (1) showed histological changes in liver represented in hyperpalsia in kufper cells. This results similar to recent studies mentioned that Newcasstle virus outbreak in a poultry facility in Japan was characterized, among other lesions, by hepatic necrosis [16] .

The results of lung mice infected with same concentration of this virus revealed to partial pnemonia and thicking the intra alveolar walls. This results accept with other reported mentioned that some Newcasstle virus strains have been shown experimentally to cause moderate lesions in the respiratory system, these changes were obtained only through aerosolization or use of very high viral titers direct air sac instillation of the virus [(17,18).] While the results of lung mice infected with same concentration from Newcasstle virus suspension recorded increase in number of glial cells(glialosis) and apoptosis in brain cells. This results agreement with some studies mentioned finding Interactions between the Newcastle disease virus and mouse tissues [(19,20).] Causes of histopathological changes in liver ,lung and brain of infected mice perhaps due to virulence of Newcasstle virus and rapid replication effect on three systems are digesive system (e.g: liver) , respirtory system (e.g :lung) and nervous system e.g: brain.([21.22,23])

Conclusion

The Newcasstle virus suspension caused clear histological changes in liver ,lung and brain of mice (Balb /c).

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the College of biotechnology, Al-Qasim Green University, Iraq and all experiments were carried out in accordance with approved guidelines.

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