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Overview of Avian Corona virus, its prevention and control Measures

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Abstract- *Avian Corona virus is a disease which is effecting bird's upper respiratory tract. It is caused by Corona virus which belongs to family* ***Corona viridae.*** *This also called Infectious Bronchitis as this infects the bronchioles and can also cause highest mortality ratio. The way of spreading of disease is Aerosol means that disease can transfer from bird to bird through air and it can also spread out through droppings of birds. This study will provide a support to diagnose of disease and also give a proper policy to fight with disease in order to minimize the mortality rate. Avian Corona virus is a viral disease so there is no treatment for it but there are some precautionary measures and vaccination program which will be help to minimize the mortality rate. Due to its spreading mode which is air it has small or short tenure of incubation period means if virus enters in a shed it will effect 100% flock in short time, so we need to stop that virus from entering in the shed so for this reason we need follow the given precautionary measure. Aim of this study is to minimize the economic loss due to Avian Corona virus and to give some extra knowledge to the people related to poultry industry.*

Keywords

IB, Avian Corona Virus, Viral disease, no treatment, Corona viridae

Introduction to disease

Infectious bronchitis in hens is a highly contagious upper respiratory tract infection [1, 2]. Along with respiratory symptoms, decrease in egg production and bad quality of egg and some strains can induce nephritis [3]. Although there are live and killed attenuated vaccination are available in market which provide immunity, distinct antigenic variants of the Infectious Bronchitis Virus (avian coronavirus) that causes the disease do not cross protection, creating problem to controlling the virus the virus. ELISA and HI tests for blood antibodies, as well as RT-PCR and virus isolation are among the diagnostic assays available in embryonated eggs [4, 5]. In order to genetically type the virus Spike gene is use [6,7,8]

Cause of Disease

The infectious bronchitis virus is an avian gamma coronavirus that primarily affects chickens, while it has also been detected in peafowl and pheasants, which may be infected sub clinically [9]. The virus is found all over the world,

and there are numerous antigenic variants that can coexist in a given area [10]. Some Infectious Bronchitis Virus kinds are widespread, whereas others are only found in specific areas [11]. Virus can be transmitted sporadically for up to 20 weeks after infection in those vaccinated with live Infectious Bronchitis Virus and naturally infected chickens [12, 13, 14]. In most cases, the incubation period is 1-2 days with the top in viral excretion from the tract of respiration occurring 3–5 days after infection. [15]

The pathogenicity of the Infectious Bronchitis VIRUS and the physiological systems implicated are effected by a variety of factors.

- Cold
- stress
- virus strain age, strain, immunological condition, and food of chickens
- Co infection with Mg, MS, E.coli, and/or A.paragallinarum can also worsen the condition. [16,17]

Clinical Signs of Disease

Morbidity of IB is 100% after 10-14 days and chicks may have sneeze, cough, and have tracheal rales [18, 19]. Conjunctivitis and dyspnea, as well as face edoema, are common symptoms, especially when a bacterial sinus infection is present. Chicks who snuggle under heat lights may appear depressed [20,21]. The amount of food consumed and the amount of weight gained are both lowered [22]. Nephropathogenic strains can produce respiratory symptoms, followed by despondency, huff feathers, moist droppings, increased intake of water, and cause mortality [23]. In layers egg production can plummet by 70%, and deformed eggs frequently, fragile, with thin, rough, light shells, wrinkled, and/or, as well as being smaller and having watery albumen [24]. It may take up to 8 weeks for egg production and quality to recover to normal. Mortality rates in most outbreaks are below 5%, but they can reach 58%-60% when sickness remains aggravated via concomitant infection due to bacterial or when nephropathogenic strains cause nephritis (interstitial) in chicks [25]. False layer syndrome is caused by infection of chicks that causes chronic oviductal damage, resulting in breeders or layers who never reach standard levels of output.[26,27]

Lesions

Lesion on trachea, sinuses, and nasal passages may contain serous, catarrhal, or caseous exudates, and the air sacs a foamy exudate that progresses to hazy thickening in the respiratory system. Caseous airsacculitis, perihepatitis, and pericarditis may occur if the infection is exacerbated by E coli. Infected birds may have cystic oviducts, whereas those in lay have an oviduct with reduced weight and length, as well as ovaries that have regressed [28-31]. Infection with nephropathogenic strains causes enlarged, pale kidneys with urate-filled tubules and ureters; in birds with urolithiasis, the ureters may be clogged with urates and contain uroliths, and the kidneys may atrophicate.

How to find out Disease

ELISA or HI testing can be utilized to identify developing immunizer titers, while RT-PCR and sequencing can be utilized to distinguish and type viruses [32]. Because of likenesses to gentle types of sickness brought about by specialists, for example, Newcastle illness infection, avian metapneumovirus, irresistible ILT infection, mycoplasma, A paragallinarum, and Ornithobacterium rhinotracheale, research facility affirmation is needed for analysis of respiratory types of irresistible bronchitis [33]. When there is a background marked by respiratory infection or diminished egg creation, ELISA can be utilized to show seroconversion or an ascent in immunizer titer against Infectious Bronchitis Virus, just as hemagglutination hindrance or infection balance measures. Infection

recognition and ID are typically used to make an authoritative conclusion. Vaccination of homogenates of tracheal, cecal tonsil, and additionally kidney tissue into 9-to 11-day-old SPF chicken undeveloped organisms can be utilized to seclude the infection, with Infectious Bronchitis Virus improvement showed by incipient organism hindering and twisting, just as urate statement in the mesonephros, and variable mortality [34]. Infectious Bronchitis Virus can likewise be disconnected in tracheal organ societies, with cilial motility halting showing viral turn of events. Some field strains might require a few visually impaired sections of the infection to be separated. Switch transcriptase PCR methods are regularly used to distinguish viral RNA in nucleic corrosive concentrates of tracheal, cecal, tonsil, or renal tissue [35-38]. To analyze pestilences created by serotypes other than those of the inoculations utilized in a herd, viral composing is basic [39]. Sera from SPF hens contaminated with known serotypes in infection balance tests were utilized to recognize serotypes. Be that as it may, because of the significant expense and time responsibility, it isn't generally accessible. The S1 area of the spike glycoprotein can be used to distinguish the infection's hereditary kind, which relates to its serotype. Nucleotide sequencing can be utilized to analyze RT-PCR items delivered from this space, and the derived amino corrosive arrangement can then measure up to successions in Gene Bank to evaluate its relatedness to known strains [40-42].

How to control Infectious Bronchitis

Vaccination: To control the disease, attenuated live and dead vaccinations are employed, however because there's little or no cross reactivity across vaccine types, the proper vaccine type must be utilized. Antimicrobial therapy may lower mortalities caused by aggravating bacterial infections, however no medicine changes the course of Infectious Bronchitis Virus infection [43, 44]. In weather, raising the ambient temperature can help minimize mortality, while lowering protein levels in feed and supplying electrolytes in drink can help with nephropathogenic strain outbreaks [45]. Immunization with live-attenuated vaccinations may cause moderate respiratory symptoms. These vaccines are given to 1- to 14-day-old chicks through spray, water, or eye drop, and also the birds are usually revaccinated 2 weeks following the primary immunization [46]. Revaccination with a unique serotype may end up during a greater level of protection. In breeders and layers, attenuated or adjuvanted inactivated vaccines will be utilized to decrease egg production losses and convey protective maternal antibodies to progeny [47]. Infectious Bronchitis Virus comes in an exceedingly kind of forms, and novel or variant varieties that are not entirely controlled by existing vaccinations are discovered on an everyday basis [48]. Historically, variant viruses have resulted through mutations that have accumulated over time because the virus multiplies (genetic drift). In coronaviruses, however, recombination can occur, leading to distinct viruses which will or might not cause disease [49]. Vaccines should be chosen supported knowledge about the foremost common virus types within the area. Because the connection between Infectious Bronchitis Virus type and protection isn't perfect, choosing the simplest vaccination (or combination of vaccines) may necessitate in vivo testing [50-52]. The Massachusetts strain is found within the most generally used live vaccinations round the world (Mass41, H120 and H52). [53,54] Additionally, a spread of Infectious Bronchitis Virus vaccine types are approved to be used in various countries, moreover as live and killed autogenous vaccines tailored to the region's variant virus [55].

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Biosecurity

Word Bio means Life and Security means to secure, collectively Bio security means the protect birds from living organisms like microbes and other harmful organisms [56]. The biosecurity is defined as set of practices which are done in the farm in order to save from living organisms. There are some practices by which we can save our flock from microbes. [57]

- ✓ Fumigation, Sanitation and disinfection of farm and farm equipment should be done after every flock.
- ✓ Don't allow anyone in the farm without sanitation.
- ✓ Use sanitized equipment.
- ✓ Give hygienic feed and water to bird.
- ✓ Use B, BB, BBB Level of biosecurity according to your requirement.

Key points

- ✓ An avian coronavirus causes infectious bronchitis.
- ✓ Because of the virus's potential to quickly evolve, ongoing surveillance is required to detect Infectious Bronchitis Virus kinds prevalent in a given area.
- ✓ Because different antigenic types do not cross-protect, selecting the right vaccine(s) for protection is critical.

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