Gambaran Patologis dan Karakterisasi Molekuler Gen VP1 Virus *Infectious Bursal Disease* (IBD) pada Ayam Broiler Komersil

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INTISARI

Infectious Bursal Disease (IBD) atau Gumboro merupakan penyakit ayam muda bersifat akut serta sangat mudah menular. yang disebabkan oleh virus IBD (IBDv) dari keluarga Birnaviridae. Virus IBD mempunyai target organ bursa Fabrisius, sehingga dampak penyakit IBD adalah bersifat imunosupresif. Tingkat morbiditas ayam mencapai 100%, sedangkan tingkat mortalitas bervariasi 20 – 100%, sehingga menimbulkan kerugian ekonomi sangat tinggi. Pengendalian utama dilakukan dengan program vaksinasi aktif di *hatchery* ataupun di farm. Namun kasus IBD masih banyak terjadi, yang diduga terdapat variasi antara virus vaksin dan virus lapangan yang mempengaruhi efektivitas vaksin. Protein VP1 IBDv berperan dalam antigenesitas, virulensi dan patogenitas. Penelitian ini bertujuan untuk melakukan karakterisasi gen VP1 virus IBD isolat lapang.

Materi penelitian adalah 26 sampel organ bursa Fabricius, limpa, timus, junction di antara proventriculus dan ventriculus, otot paha, ginjal dari ayam broiler terdiagnosa penyakit IBD dari peternakan komersil di Daerah Istimewa Yogyakarta (DIY) dan Jawa Tengah. Sampel organ dilakukan pemeriksaan histopatologi, sedangkan bursa Fabricius dilanjutkan uji molekuler *Reverse Ttranscriptase Polymerase Chain Reaction* (RT-PCR) untuk gen VP1. Amplikon dilanjutkan sekuensing dan dianalisis menggunakan Mega X.

Hasil penelitian secara makroskopis menunjukkan edema, penebalan plica, masa gelatin di mukosa serosa, hemoraghi, atropi, eksudat di lumen bursa Fabricius. Atropi terjadi di organ timus. Limpa terlihat spot-spot berwarna abu-abu. Petechiae atau hemorhagi terdeteksi pada otot paha, dan ginjal bengkak dan pucat, serta di junction proventrikulus-ventrikulus. Histopatologis bursa Fabricius menunjukkan vakuolisasi folikel, edema, infiltrasi heterofilik, atrofi folikel, kongesti, dan hemoraghi. Timus dan limpa menunjukkan adanya nekrosis multifokal. Hemoraghi pada otot paha junction proventrikulus-ventrikulus pars mukosa. Vakuolisasi terlihat di tubulus ginjal (nefrosis). Konfirmasi dengan RT-PCR dari 26 bursa sampel Fabricius dari ayam yang diduga terinfeksi IBDV menunjukkan 22 sampel positif dan 4 sampel negatif. Analisis filogenetik fragmen gen VP1 menunjukkan IBD yang sangat ganas (vvIBD) dan termasuk genotipe B2.

Kata kunci: *Infectious Bursal Disease*; patologi; RT-PCR; VP1

Pathological Description and Molecular Characterization of VP1 Genes of *Infectious Bursal Disease* (IBD) Virus in Commercial Broiler

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ABSTRACT

Infectious Bursal Disease (IBD) or Gumboro is an acute and highly contagious disease of young chickens caused by the IBD virus (IBDv) from the Birnaviridae family. The IBD virus targets the bursa of Fabrisius result in immunosuppressive. The morbidity rate of chickens reaches 100%, while the mortality rate varies from 20 – 100%, causing very high economic losses. The main control is by active vaccination in the hatchery or farm. However, IBD cases is still high, which are suspected to be variations between the vaccine virus and the field virus which affect the effectiveness of the vaccine. The VP1 IBDv protein plays a role in antigenicity, virulence, and pathogenicity. This study aims to characterize the VP1 gene of the IBD virus in field isolates.

The research materials were 26 sampes the bursa of Fabricius, spleen, timus, junction between the proventriculus and ventricle, thigh muscles, kidneys of broiler chickens diagnosed with IBD from commercial farms in the Special Region of Yogyakarta (DIY) and Central Java. The organ samples were subjected to histopathological examination, while the bursa of Fabricius was continued with the Reverse Transcriptase Polymerase Chain Reaction (RT-PCR) molecular test for the VP1 gene. The amplicons were followed by sequencing and analyzed in Mega X.

The results macroscopicly showed edema, plica thickening, gelatinous masses in the serous mucosa, hemorrhagic, atrophic, exudate in the lumen of the bursa of Fabricius. Atrophy occurs in the timus organ. The spleen looks gray spots. Petechiae or hemorrhages were detected in the thigh muscles, and the kidneys were swollen and pale, and at the proventriculus-ventriculus junction. Histopathology of bursa of Fabricius shows follicular vacuolization, edema, heterophilic infiltration, follicular atrophy, congestion, and hemorrhage. Timus and spleen showed multifocal necrosis. Hemorrhage in the thigh muscle of the proventriculus-ventriculus pars mucosa junction. Vacuolization seen in the kidney tubules (nephrosis). Reverse transcriptase-PCR of 26 bursa Fabricius samples from chickens suspected of being infected with IBDV showed four negative and 22 positive samples. Phylogenetic analysis of the VP1 gene fragment indicates highly malignant IBD (vvIBD) and belongs to the B2 genotype.

Keywords: *Infectious Bursal Disease*; patology; RT-PCR; VP1