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Research Article

A Unique Case of Trueperella Pyogenes Causing Hepatic Abscesses in Pigeons

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Abstract

The present study reports the identification of the etiology for hepatic abscesses leading to heavy mortality in pigeons from Thrissur, Kerala. The cultural and biochemical characteristics confirmed the isolate as *Trueperella pyogenes*. The high antibiotic resistance and pathogenicity studies in mice demonstrated the ability of the isolated bacteria to cause death in affected birds.

Keywords: *Trueperella pyogenes*, American fan tailed pigeons, Hepatic abscess.

Introduction

Trueperella pyogenes (previously, *Corynebacterium pyogenes*) is an opportunistic pathogen, causing suppurative infections in a wide range of hosts, including avians (Barbour *et al.*, 1991) and domestic animals (Addo *et al.*, 1977). It is known to spread hematogenously to cause abscesses and suppurative lesions in various organs and tissues (Tolle *et al.*, 1983). This organism has been reported to cause liver abscesses in large animals like cattle (Narayanan *et al.*, 1998), but its role as an etiological agent for hepatic abscesses in birds like pigeons is yet to be established. The present study reports the isolation and characterization of *Trueperella pyogenes* from a hepatic abscess in an american fan tailed pigeon.

Materials and Methods

A commercial flock of American-fan tailed pigeons from Thrissur, Kerala was presented with heavy morbidity and mortality. A detailed post-mortem examination of a representative bird, revealed air-sacculitis accompanied by hepatitis and abscesses on the dorsal side of the liver. The tissue and associated material from the hepatic abscess was collected and cultured on- Blood agar, Brain heart infusion (BHI) agar and Mac Conkey agar by incubation at 37°C for 48 hrs under both aerobic and anaerobic conditions. The isolation and characterization by biochemical tests was done by standard tests (Barrow and Feltham, 1993). The antibiotic sensitivity of the isolate to common antibiotics was tested by an antibiogram (Bauer *et al.*, 1966). Further, the pathogenicity of the isolate was successfully demonstrated in

Balb/c mice (Kan *et al.*, 2009). The test was carried out with various log dilutions of the basic culture (10^{-6} , 10^{-7} , 10^{-8} and 10^{-9}) in 0.5 ml saline administered via two routes; intra-venous and sub-cutaneous in mice.

Results

The organisms cultured under anaerobic conditions were observed as rough shaped, creamy colonies on blood agar and BHI agar. The colonies were observed to show β -hemolysis on blood agar. Further, the isolate was identified to be gram-positive pleomorphic non-motile cocco-bacillary organisms. The organisms were characterized to be negative for catalase, oxidase, urease and citrate utilization. These nitrate non-reducing organisms were positive for indole production and

were found to be fermenting glucose, lactose, maltose, trehalose, xylose and raffinose but not sucrose, mannitol, salicin, sorbitol, mellibiose and arabinose. The isolated culture was hence identified as *Trueperella pyogenes*. The isolate was identified to be sensitive for streptomycin and chloramphenicol and resistant to regular antibiotics like amoxicillin, ampicillin, ceftriaxone, gentamicin, tetracycline, sulphadiazine, gatifloxacin, enrofloxacin, ciprofloxacin, tobramycin and polymixin B. Further, the isolate was demonstrated to be highly pathogenic by causing death to mice in by intra-venous administration in a dose-dependant reaction. Death was observed within four hours of administering the highest concentration of 10^{-6} dilution. The least tested dilution of 10^{-9} of the isolate could cause death within 24 hr of administration. The reaction to the sub-cutaneous administration of the isolate was also observed to be dose-dependant. Abscesses

were observed within 24 hours of sub-cutaneous inoculation with 10^{-6} and 10^{-7} dilutions of *T. pyogenes*. The weaker dilutions, 10^{-8} and 10^{-9} CFU could cause abscesses within 72 hr of administration.

Discussion

Trueperella pyogenes is a gram positive, pleomorphic and facultative anaerobe reported to cause suppurative and pyogenic infections (Brinton *et al.*, 1993; Reddy *et al.*, 1982). The characterization of the isolate by its cultural, growth and biochemical characteristics confirmed the organism as *A. pyogenes*. Similar reports for identification were reported by Wust *et al.*, 1993 and Narayanan *et al.*, 1998. The isolate was identified to be resistant to most of the regular antibiotics. The

ability of the organisms to cause pyogenic abscesses and their highly pathogenic nature demonstrated in mice, proved them to cause death in the affected birds. The present study presents a highly pathogenic *A. pyogenes*, which needs to be further characterized to help prevent further economic losses.

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