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Public health important bacteria *Pasteurella pneumotropica* in cat abscess

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Abstract

A cat with history of pyrexia, anorexia and swelling on left forelimb was presented to Veterinary Polyclinic, Guntur, Andhra Pradesh. Initially the cat was treated symptomatically for fever and anorexia, as the size of swelling was increasing progressively, the abscess fluid was aspirated aseptically and submitted to Veterinary Biological and Research Institute, Vijayawada. For isolation of etiological bacteria, the fluid was tested by cultural examination and identified as *Pasteurella* species based on colony morphology and different staining methods. Vitek 2 (Biomerieux) microbial identification system was used for confirmation of colonies as *Pasteurella pneumotropica* which is zoonotically important bacteria and causing threat to cat owners and immunocompromised individuals. The same isolate was subjected for antibiotic sensitivity test and found sensitive for antibiotics like Chloramphenicol 30 mcg, Norfloxacin 10 mcg, Cefotaxime 30 mcg, Neomycin 30 mcg, Levofloxacin 5 mcg, Tetracycline 30 mcg, Oxytetracycline 30 mcg, Ciprofloxacin 5 mcg, Amoxycylav 30 mcg. Although zoonotic importance of *Pasteurella pneumotropica* species through cat bite is well known, the present study reports the isolation of rare *Pasteurella pneumotropica* from the abscess in cat suffering with pyrexia, proves the chance of getting infection through abscess. It recommends the precautionary measures to be followed by the persons at high risk.

Keywords: Antibiotic sensitivity test, cat abscess, *Pasteurella pneumotropica*, Vitek 2

Introduction

Pasteurella species are most common pathogen causing subcutaneous abscess and pyothorax in cats and reported as potential zoonotic bacterium causing opportunistic infections in both humans and pet animals and sometimes fatal to immunocompromised individuals with history of cat bite [1].

The present case report describes the presence of *Pasteurella Pneumotropica* in cat abscess material isolated by cultural examination and confirmed by using fully automated microbial identification system called Vitek 2 which was designed to identify bacteria based on 47 types of biochemical tests in approximately 10-14 hrs [2].

Materials and Methods

A 4 months aged cat was presented to Veterinary Polyclinic, Guntur with symptoms of high fever 103°F, anorexia and abscess on left forelimb. Initially the cat was treated for three days with Injection CPM 5 U (Chlorpheniramine an antihistamine) and Injection Melonex 5 U both subcutaneously. As the size of abscess fluid was progressively increasing the abscess fluid was aspirated aseptically and sent to Veterinary Biological and Research Institute, Vijayawada which is state referral laboratory for cultural examination and ABST.

The sample was subjected for routine bacteriological examination by inoculating in to Brain heart Infusion broth and incubated for 24 hrs, then streaked on to Brain heart Infusion Agar, 5% Sheep Blood agar plate (Himedia) and Macconkey agar. After 24 hrs of incubation at 37 °C, the bacterial colonies were stained with Grams staining and Giemsa staining.

For final confirmation of the isolate, single pure colony was inoculated in to BHI broth, incubated for 24 hrs at 37 °C and tested with Vitek 2 (Biomerieux) in the following procedure; 1. Sterile polystyrene test tubes were taken 2. Test suspension was prepared by adding culture material to sterile Normal saline, 3. Density was adjusted in between 0.50–0.63 in DENSICHEK provided with Vitek, 4. Then test suspension prepared was loaded on to GN cassette and followed user guidelines to run sample in Vitek 2 for 10 hrs [2].

Antibiotic sensitivity test was conducted for pure colony in BHI broth by using antibiotic discs ^[3]. A total of 15 antibiotic discs like Gentamicin 10 mcg (GEN 10 mcg), Amoxyclav 30 mcg (AMC 30 mcg), Amikacin 30 mcg (AK 30 mcg), Penicillin G 10 U (P 10 U), Ciprofloxacin 5 mcg (CIP 5 mcg), Enrofloxacin 10 mcg (EX 10 mcg), Oxytetracycline 30 mcg (O 30 mcg), Chloramphenicol 30 mcg (C 30 mcg), Neomycin 30 mcg (N 30 mcg), Cefotaxime 30 mcg (CTX 30 mcg), Norfloxacin 10 mcg (NX 10 mcg), Streptomycin 10 mcg (S 10 mcg), Levofloxacin 5 mcg, Tetracycline 30 mcg and Erythromycin 15 mcg (E 15 mcg) supplied by Himedia, Mumbai were used for ABST.

Results and Discussion

In cultural examination of abscess fluid, dew drop colonies on Brain heart infusion agar was observed as shown in figure 1; Non haemolytic grey colonies on 5 % Sheep blood agar; no growth on MacConkey agar. In Grams and Giemsa staining of dew drop colonies, pink coccobacilli and bipolar were observed respectively. Similarly Razali *et al.* (2020) ^[4] reported that “*Pasteurella* Spp. Were identified on the basis of Grams staining (Gram negative coccobacilli), absence of hemolysis, absence of growth on MacConkey and final identification of strains was done using AP120NE commercial kits by Biomerieux”.

The isolate from abscess fluid was confirmed as *Pasteurella pneumotropica* in Vitek 2 which is an automated microbial identification system by Biomerieux. By using GN cards, more than 150 fermentative and non-fermentative gram negative bacteria can be confirmed up to species level based on 47 biochemical methods, substrates measuring carbon source utilization and enzymatic activities ^[5]. Similarly Funk *et al.* (1998) ^[6] documented that Vitek 2 was able to identify two isolates of *Pasteurella pneumotropica* out of two tested as part of evaluating Vitek 2 for Gram Negative bacteria and Vitek 2 GN cards can identify 96.8% of the isolates up to species level was reported by Pincus DH ^[7].

In ABST, the isolate was found sensitive for Chloramphenicol 30 mcg, Norfloxacin 10 mcg, Cefotaxime 30mcg, Neomycin 30 mcg, Levofloxacin 5 mcg, Tetracycline 30 mcg, Oxytetracycline 30 mcg Ciprofloxacin 5 mcg, Amoxyclav 30 mcg. Whereas Razali *et al.* (2020) ^[4] stated that *Pasteurella* strains were resistant to Amoxicillin/ clavulanic acid 30 mcg, Penicillin 10 IU, ampicillin 10 IU, Tetracycline 30 mcg. The difference in antibiotic susceptibility may be due to variation in strains isolated and antimicrobial resistance developed. Similarly according to UK standards for microbiology Investigations *Pasteurella* species is generally susceptible to Chloramphenicol, Penicillin, Tetracyclines and macrolides ^[8].



Fig 1: Dew drop colonies on brain heart infusion agar medium

Conclusion

The results were communicated to Veterinary Polyclinic, Guntur and suggested to treat the abscess with one of the sensitive antibiotics listed in ABST. Instructed the veterinary officers to educate the pet owners, veterinary staff handling cats with pyrexia, abscess and immune compromised individuals about the safety measures to be followed while handling the cats as *Pasteurella pneumotropica* has public health concern.

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