ISOLATION, IDENTIFICATION, SEROTYPING AND ANTIBIOTIC RESISTANCE PATTERN OF SALMONELLA ISOLATED FROM FECAL SAMPLES OF KITES

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ABSTRACT

Salmonella is an important zoonotic pathogen of economic importance. The present study was carried out to investigate serotypes and drug resistance pattern of *Salmonella* isolated from fecal samples of kites. Out of 40 fecal samples screened, only 3 samples were found positive for *Salmonella*. All the 3 isolates were studied for their antibiotic sensitivity pattern employing disc diffusion technique using commercial antibiotic discs. *In vitro* Antibiotic sensitivity pattern of these *Salmonella* isolates against 11 antibiotics revealed highest sensitivity towards chloramphenicol, gentamycin and ciprofloxacin followed by neomycin, cefotaxime, ofloxacin norfloxacin and amoxyclav. The organisms were found resistant towards streptomycin, tetracycline, and ampicillin. The present findings indicate that the kites may harbor organisms like *Salmonella* which may pose human health hazards.

KEY WORDS: Kite, *Salmonella*, Serotyping, Antibiotic sensitivity

INTRODUCTION

Salmonella is a zoonosis with a number of wild and domestic animal hosts (Wernery, 1992]. There are more than 2500 serovars or serotypes of this bacterium known today. Some serotypes have developed host adaptation and are, therefore, found in only a few animal reservoirs (Baumler *et al*. 1998, Uzzau *et.al*.,2000). However, most serotypes are ubiquitous or unadapted and can be found in a number of animal hosts. The present study was carried out to investigate serotypes and drug resistance pattern of S*almonella* isolated from fecal samples of kites.

MATERIALS AND METHODS:

In the present study the kites faecal samples (n=40) were collected with a sterile swab and were processed. The faecal samples were collected from the injured kites during the Kite festival of Dist: Ahmedabad, State:Gujrat which were brought to the Veterinary hospital for treatment purpose.

Isolation and Characterization

The isolation of *Salmonella* spp was carried out by culturing the faecal samples into selenite F broth and incubated at 37 ^{0}C for 18 h, then from each broth the culture were streaked on selective agar i.e Brilliant Green Agar and Salmonella Shigella agar plates and further incubated for 24 h at 37 ^{0}C. Colonies of *Salmonella* showing colourless, transparent with black centered were isolated on Salmonella Shigella agar and pink colored colonies were isolated on Brilliant Green Agar. The isolated colonies were further subjected to morphological and biochemical characterization. The primary tests included Gram's stain, motility and tests like catalase, oxidase Triple Sugar Iron agar (TSI), Indol, Methyl red, Voges-Proskauer and Citrate utilization test.

Serotyping:

Salmonella isolates obtained in pure culture were referred to National Salmonella and Escherichia Center, Central Research Institute, Kasuali, Himachal Pradesh for serotyping.

Antimicrobial susceptibility testing

The antibiotic susceptibility was tested using disk -diffusion test (Bauer *et.al.,* 1966) performed on Mueller-Hinton agar against eleven commercially available antibiotic disc of known concentration (Hi-Media, Mumbai). Each isolates were inoculated in BHI (brain heart infusion) broth, following 24 h of incubation at 37^0C, the broth was streaked by using sterile swabs on Mueller-Hinton agar plates. Plates were kept at room temperature for 5 min, and then diffusion disks with antimicrobial drugs were placed on the plates and incubated for 24 h at 37^0C. The antibiotics used were: ampicillin (10 μg), amoxyclav (30 μg), cefotaxime (30 μg), ciprofloxacin (5 μg), chloramphenicol (30 μg), streptomycin (10 μg), gentamicin (10 μg), neomycin (30 μg), norfloxacin (10 μg), ofloxacin (5 μg), and tetracycline (30 μg). Results were interpreted by measuring inhibition zones with a millimetre scale.

RESULTS AND DISCUSSION

Out of 40 fecal samples processed, total 3 (7.5%) *Salmonella* isolates were recovered. On serotyping, out of 3 isolates, 1 was non-viable and 2 belonged to *Salmonella* Typhimurium having serotypes 4,12 :i: 1,2. Several studies were performed on the presence of *Salmonella* in wild birds. In Spain, Reche *et al.* (2003) quoted a prevalence of 4% in raptors, mainly *S.* Typhimurium DT 104. Results from our study indicate that the prevalence of this serotype in the healthy wild bird population is low. Earlier studies have pointed to certain species (gulls and corvids) in which the prevalence of *Salmonella* is sometimes high (2% to 20%), and argued that concern should be strong about epidemiologic disease transmission with these birds (Hubálek *et al.,* 1995 and Palmgren H *et al.,* 1997).

S. Typhimurium is commonly identified in a wide range of animal hosts, food sources, and environments, but little is known about the factors mediating the spread of antibiotic resistance in this ecologically complex serovar.

In the present study, isolates showed sensitivity towards chloramphenicol, gentamycin and ciprofloxacin followed by neomycin, cefotaxime, ofloxacin norfloxacin and amoxyclav whereas resistance to streptomycin, tetracycline, and ampicillin was detected. Highest sensitivity was shown towards chloramphenicol. In one of the study carried out in headed gulls by Hubálek *et al.* (1995) reported resistant to at least three agents (penicillin, tetracycline and sulfomethoxazol-trimethoprim). The *Salmonella* isolates from chickens were more commonly resistant to tetracycline, sulfamethoxazole, nalidixic acid, and trimethoprim; this resistance may be attributed to indiscriminate use of antibiotics at recommended doses or at subtherapeutic doses as feed additives to promote growth, and as chemotherapeutic agents to control epizootics on the farms.

Resistance to streptomycin was also higher and is in conformity with other findings (Cardoso *et.al*.,2006). The resistance to tetracycline and streptomycin commonly observed among the *Salmonella* isolates has been frequently reported. This elevated resistance may be explained by the possible diffusion of the test (A) resistance gene observed in an epidemiological study with *Salmonella* strains isolated from animals (Pezzella *et al*., 2004).

The diffusion of zoonotic bacteria resistant to antibiotics is an important concern for the treatment of human infections, because it can compromise the effectiveness of the therapy.

In conclusion a constant supervision of *Salmonella* in wildlife and its antibiotic-susceptibility is necessary for the early identification of zoonotic strains and the emergence of new resistance profiles, and to evaluate the control measures. Our findings in wildlife and the widespread *Salmonellae* outbreaks underline the need to better coordinate investigations between human and veterinary health and food safety organizations and networks.

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