Prevalence of salmonellosis in some common snakes of Bangladesh

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A cross-sectional study was conducted to investigate the prevalence of Salmonella in fecal samples of snakes at Sitakund and Foy’s Lake area of Chittagong district. In total 25 samples that were collected from August 2008 to March 2009, were subjected for the screening of Salmonella using the conventional cultural procedures with SS agar. From those samples, 18 were positive which form 72% of total collected samples. The prevalence of Salmonellosis in Asiatic Rock Python, Rat Snake and Copperhead is the highest which is 100 and the lowest prevalence in Banded Krait and Golden Flying Snake which is 50%. Medium prevalence was found in Spectacled Cobra (66.67%), Common Vine Snake (66.67%) and Monocled Cobra (60%). It was observed that prevalence of Salmonellosis is higher in case of non-poisonous snakes like Asiatic Rock Python, Rat Snake and Copperhead and are lower in case of poisonous snakes like Spectacled Cobra, Monocled Cobra, Banded Krait and Common Vine Snake. Salmonellosis was more in large population areas where snake boxes were in close contact. The study also reveals that prevalence of Salmonellosis somewhat more in mid age which is more than 25%. During the collection of samples all the snakes were healthy which is normal phenomenon for most of the reptiles bearing salmonellosis.

Key words: Salmonellosis, snakes, prevalence.

INTRODUCTION

In Bangladesh, reptile farming is quietly a new application. Now there is an established crocodile farm in Mymensing. Another reptile, snakes are reared from ancient ages for various purposes. Snake charmers rear snakes mainly for livelihood by showing play. Some charmers took attempt to establish an organized snake farm but till they could not make it possible. In near future there has a chance to establish a snake farm in our country. Now the snakes that are reared in captivity are mostly belongs to snake charmers’ house and rest are in the zoo. But, many people such as veterinarians, more charmers, Herpetologists, researchers will involve in near future. As a result, they will be at risk from reptilian zoonosis.

Among the reptilian zoonoses the most recognized one is salmonellosis. Salmonella spp. is gram negative straight rods, usually flagellated, facultative anaerobes (Krieg et al., 1984). There are over 2000 serotypes within the species S.enteritidis (e.g., S.enteritidis serotypes typhimurium), while S. typhi, causative agent of typhoid fever and S. choleraesuis have only one serotype each. The classification system is usually abbreviated and the enteritidis is deleted and the name S. typhimurium is applied. Salmonellae are pathogenic to a variety of animals and humans (Fox et al., 1991).

The zoonotic significance of reptilian salmonellosis was first reported in 1963 when a 7-month old infant acquired the disease from a pet turtle, although the potential had been recognized since 1946 when Salmonella spp were originally isolated from turtles (Lamm et al., 1972). So, there is a greater chance to be infected with salmonellosis from other reptile source such as snakes. This study aims to give the overall prevalence of Salmonella in feces of various species of 25 snakes of

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various ages to prove the presence of salmonellae in subclinical form that may lead to some sort of zoonotic diseases.

MATERIALS AND METHODS

Study area and duration

The study continued from August 2008 to March 2009, during my extramural studies (internship) phase. In this phase samples were collected from snakes of snake charmers’ house from Foy’s lake and Sitakunda area of Chittagong district.

Collection of faecal samples

Total 25 samples were collected from 3 snake charmer’s house of which 12 samples from Md. Salim of Foy’s Lake, 8 from Sumon Shil of Foy’s Lake and 5 from Abul Kashem of Sitakund of Chittagong district (Figure 1). For collection of sample each snake was fed fishes and then fecal samples were collected on 3rd to 5th days depending on time of defecation of snake after taking feed. Then the samples were kept into the refrigerator at 3-4°C at the Microbiology Laboratory of Chittagong Veterinary and Animal Sciences University and the samples were stored there until further study was conducted.

Isolation and identification of Salmonella from the faecal samples

The isolation and identification of Salmonella in the faecal samples was carried out on SS agar (Figure 2). Briefly, 1g of each of the collected faecal sample was diluted into 10 ml of PBS and then the diluted samples were centrifuged at 1000 RPM for 10 minutes. After that from supernatant of each centrifuged sample individual streaking was done on separate Petri dish filled with SS agar. After streaking, the Petri dishes were kept at 37°C for 48 hours. Then the colonies are observed for identification of Salmonella.
RESULTS

Overall, of the 25 samples investigated, 18 were found positive with *Salmonella* (Table 1). The prevalence of Salmonellosis in Asiatic Rock Python, Rat Snake and Copperhead is the highest which is 100% and the lowest prevalence in Banded Krait and Golden Flying Snake which is 50%. Medium prevalence was found in Spectacled Cobra (66.67%), Common Vine Snake (66.67%) and Monocled Cobra (60%). It was observed that prevalence of Salmonelllosis is higher in case of non-poisonous snakes like Asiatic Rock Python, Rat Snake and Copperhead and is lower in case of poisonous snakes like Spectacled Cobra, Monocled Cobra, Banded Krait and Common Vine Snake.

Prevalence of Salmonellosis is higher in mid age group which is more than 25%, comparatively lower in early age group which is more than 20% and lowest in old age group which is more than 15%. But within same species it may vary for different ages (Figure 3).

DISCUSSION

Estimates of reptiles harboring *Salmonella* spp. have been reported to be as high as 83.6 to 93.7 %, depending on the method of testing. Turtles may be infected at a rate of 12.1 to 85 %, snakes 16 to 92% and lizards 36 to 77 % (Chiodini et al, 1981).

One survey in Canada between 1979 and 1983 tested 150 pet reptiles submitted for necropsy: 51% of the snakes, 48% of the lizards and 7% of the turtles cultured positive for *Salmonella* spp., with 31 different serotypes identified (Onderka et al, 1985).

Although the rate of infection is quite high, reptiles usually do not show signs of disease from *Salmonella* infection and the relationship may indeed be a saprophytic one (Anonymous, 1981). In our studied snakes, there was no observed clinical sign during collection of samples.

The results obtained through this short-period of study reveals that about 72% of the collected samples were positive for salmonellosis. This could be hazardous for the public health. Because in most of the positive cases with salmonellosis are in the subclinical form. But when the organism is transmitted to human and other animals, it can produce harmful diseases.

So, peoples who will work later should be cautious in handling snakes. Otherwise, diseases may occur from relatively healthy snakes.

To our knowledge, this is the first report on salmonellosis of snakes of Bangladesh. However, further
Table 1. Salmonellosis positive in several common species of snake

<table>
<thead>
<tr>
<th>Species of Snakes</th>
<th>Total snakes</th>
<th>Result on SS agar</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asiatic Rock Python</td>
<td>3</td>
<td>+ (3)</td>
<td>100</td>
</tr>
<tr>
<td>Spectackled Cobra</td>
<td>6</td>
<td>+ (4), - (2)</td>
<td>66.67</td>
</tr>
<tr>
<td>Monocled Cobra</td>
<td>5</td>
<td>+ (3), - (2)</td>
<td>60</td>
</tr>
<tr>
<td>Banded Krait</td>
<td>2</td>
<td>+ (1), - (1)</td>
<td>50</td>
</tr>
<tr>
<td>Rat Snake</td>
<td>2</td>
<td>+ (2)</td>
<td>100</td>
</tr>
<tr>
<td>Golden Flying Snake</td>
<td>2</td>
<td>+ (1)</td>
<td>50</td>
</tr>
<tr>
<td>Common Vine Snake</td>
<td>3</td>
<td>+ (2), - (1)</td>
<td>66.67</td>
</tr>
<tr>
<td>Copperhead</td>
<td>2</td>
<td>+ (2)</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 1. Prevalence of Salmonellosis in different age group

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