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ISOLATION AND DIAGNOSIS OF SALMONELLA GERMS IN DOMESTIC AND WILD PIGEONS

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Abstract

The study included the isolation and diagnosis of Salmonella bacteria from pigeons in six districts of Salah al-Din governorate (Balad, Dhuluiya, Dujail, Samarra, Ad-Dawr, Tikrit). It took (350) samples were distributed as the following: (100) stool samples. The members of the Pigeons was as the following: Spleen (60) sample, Liver (60) sample, Intestines (50) sample, Gizzard (40) sample, Pancreas (40) sample. The total infection rate in the Pigeon's stool (31%), the incidence of infection in the Pigeon's Spleen (85%) and liver (50%), Intestines (48%), Gizzard (10%) and Pancreas (70%). 168 isolates were infected with Salmonella germination with a total isolation rate of (48%). The isolated patterns were in order, *S. typhimurium* by isolation of Salmonella bacteria was (32.7%) and *S. typhi* by 28.6% and *S. paratyphi* by 21.4% and *S. arizonae* (17.3%), the most common type are *S. typhimurium*. The effect of the months of the year on the isolation of the bacteria Salmonella increased significantly in the month of March, reaching 75% and decreased in February was 18.7%. As for the percentage of infection of Salmonella bacteria from Pigeon stools by sex, there is no significant difference between the percentage of female and male Pigeons Salmonella isolates increased significantly in Tikrit, with 60% infection rate and 40% in Balad district. Salmonella-infected birds were characterized by signs of illness such as diarrhoea, lethargy and breathing disorders.

Key words : almonella Germs, Domestic and Wild Pigeons, Salmonella germs

Introduction

Salmonella germs are diseases that are of health and economic importance because they infect humans and animals, so they are common diseases (Zoonosis) Widespread in the world. One of the main causes of the spread of Salmonella bacteria is the multiplicity of functions and the large number of serotypes as the bacteria are transmitted to humans through food and environment contaminated by birds and bricks, which are a natural reservoir (Kramer *et al*., 2010, Matheson, 2010). Control of diseases caused by Salmonella spores is difficult and this has led to the maintenance and persistence and spread of these bacteria as well as the factors that affect their survival in the spread of these bacteria (Hu *et al.*, 2002). Multiple parasites of Salmonella germs may also increase the spread of germs and make them more difficult to control (Radostitis *et al*., 2007). The severity of Salmonella infection depends on the bacteria and their severity and the immune state of the organism has an important role in determining the severity of infection and that the immunity of the organism decreases in many cases, including stress and age and serology (Melling and Alder, 1998). Bacteria and those who do not have any symptoms of the disease spread these bacteria constantly or sporadically. Studies show that 4% of typhoid patients maintain a permanent campaign of germs after recovery (Al-Shehabi, 1998). There are more than (2200) serological pattern, but there are less than (200) of which can infect the human and the serological style *S. typhimurium* of the most common serotypes common types of parasites and most. Humans are infected by food or contaminated water and may lead to bacteremia (Doyle, 1997). Salmonella is a disease of serious diseases of the Class III group (Risk group III). According to the World Health Organization (WHO) report (WHO, 1997) Birds are infected in many countries of the world (Molla *et al*., 2007, Chandra *et al.,* 2005, Lemayehu *et al.,* 2005). And the lack of studies on the injury (bath) Salmonella bacteria, especially home and free baths, which cause the spread of bacteria Salmonella in cities and wilds.

The aim of this study was to

1. Identification and knowledge of the prevalence of

salmonella in household and free bath.

2. Determination of proportions and types of serotypes that affect the bathroom in the province of Salah al-Din governorate.

Materials and Methods

Collection of samples

The study was conducted in the laboratory of bacteria of the hospital of the country of the country, where the study included 350 samples, obtained from several areas in the province of Salah al-Din (Dujail, Balad, Samarra, Dhuluiya, Tikrit, the role), for the period of August 2018 Until April 2019. Samples were collected from bird shops and from private fields. The following information was recorded on the samples (gender, age, area) from which the sample was taken.

Stool samples

100 samples of faeces were collected from both sexes and in all ages by taking a swab of the bathroom faeces using sterile cotton (Swab) and then placed directly in sterile tubes containing Tetrathionate broth and gravy Selenite Incubated at a temperature of 37°C for 24 hours and then taken from the center and using the sterile metal carrier (Loop) and planted within the transitional steel center Salmonella-Shigella agar and the middle XLD and Almakounka and incubated at a temperature of 37°C for 24 hours.

Spleen samples

Sixty samples of the spleen were collected in sterile tubes containing a broth medium Tetrathionate and gravy Selenite and incubated at 37°C for 24 hours, then take a swab by sterile metal carrier Loop To the center of the transitional steel crucifixion of Salmonella Chicala and Central MaCconkey XLD.

Liver samples

A total of 60 liver samples were collected as a small portion of the liver was taken and placed in sterile tubes containing a broth medium Tetrathionate breath and gravy Selenite, Where the same steps are performed in the samples of stool and spleen.

Intestines samples

50 samples of the intestines were collected after the internal anatomy. A piece of the intestine was taken and placed in the nasal transitional media and the same steps as the previous method mentioned in the stool, spleen and bowel samples were used.

Pancreatic specimens

40 samples of the pancreas were collected after the procedure of internal anatomy and the same steps mentioned above are used in the samples of stool, spleen, liver, intestines and pancreas.

Gizzard samples

Forty samples were taken from the Gizzard after the internal autopsy. The same steps were used in the stool, spleen, liver, intestines and pancreas samples.

Bacterial diagnosis

Salmonella developing colonies were identified on the solid agaric strata of primary isolation such as the center *Salmonella - Shigella agar* and the middle Macconkey agar. And XLD After incubation at 37°C for 24 hours, they were initially diagnosed based on phenotypic characteristics, size, color, shape and quilt, as well as the ability to ferment the lactose sugar or not ferment in the center MaCconkey agar. And then to study their qualities under the microscope after dyeing the color of Kram (Forbes *et al*., 2007).

Biochemical tests

That the process of biochemical diagnosis was based on the methods developed by (Jawetz *et al*., 2001, Quinn *et al*., 2007). If more than one pure bacterial colony was taken after the shape and nature of its pigmentation were determined by chromium and the following chemical tests were used:

1. Indol test
2. Methyl red test
3. Voges-Proskauer test
4. Citrate utilization test
5. H_2S production test
6. Urea hydrolysis test
7. Oxidase test
8. Catalase test
9. Gelatin hydrolysis test
10. Motility test
11. Suger fermentation test

Results and discussion

Results of bacterial isolation

The results of bacterial isolation on 350 birds of pigeons revealed many cases of Salmonella germs. The Salmonella germs growing above the Salmonella-Checks *SS agar* they are large, transparent and black. Salmonella germs growing above the center of Acar Xylose are not lysine de oxy coli XLD. It was characterized by a red color with a large black center.

Table 1: shows percentages of Salmonella isolated from faeces and pigeons.

the pattern	Total number of isolates	Injury percentages %
S. typhimurium	55	32
S. typhi	48	28.6
S. paratyphi	36	21.4
S. arizoinae	29	17.3
Total	168	100

Table 2: shows the percentage of organs and faeces infected with Salmonella.

Members	Number of models examined	Number of models infected with Salmonella	Injury percentages %
Spleen	60	51	85
Liver	60	30	50
Small intestine	50	24	48
The Chopper	40	4	10
Pancreas	40	28	70
Feces	100	31	31
Total	350	168	48

Table 3: shows percentages of isolation of Salmonella bacteria from wild pigeon feces and household bath.

Type of Bathroom	Number of pigeons examined	Number of infected bird with Salmonella	percentages Injury %
The bathroom is wild	65	25	38.4
Home bathroom	35	6	17.14
Total	100	31	31

Isolated Species of Salmonella

The study revealed four types of Salmonella bacteria isolated from the exposed faeces and members of the pigeon and are visible as in table 1.

Table 4: Percentage of isolation of Salmonella germs from pigeons in Saladin Governorate.

Areas	Number of birds (pigeons) examined	Number of birds (pigeons) sound	Number of birds infected with Salmonella	Percentage Injury%
A country's judiciary	95	57	38	40
Duluiyah district	80	37	43	54
Dujail district	75	43	32	43
Samarra district	40	18	22	55
Spending the floor	35	17	18	51
Tikrit district	25	10	15th	60
Total	350	182	168	48

Table 5: shows the percentages of isolation of Salmonella spores from pigeons divided by age groups.

Age groups of bird (pigeons) per month	Number of cases studied	Number of infected cases	Injury percentages %
1-6	50	27	45
7-12	55	32	58.1
13-24	65	40	61.5
25 - 36	95	50	52.6
37-48	85	19	22.3
Total	350	168	48

Table 6: shows the percentages of isolation of Salmonella spores from pigeons distributed by months of the year.

Month of Study	Number of bird (pigeons) examined	Number of bird infected with Salmonella	percentages Injury %
August	64	38	59.3
September	50	34	68
October	54	30	55.5
November	42	18	42.8
December	35	8	22.8
January	38	8	21
February	32	6	18.7
March	20	15th	75
April	15th	11	73.3
Total	350	168	48

Table 7: shows the percentages of isolation of Salmonella spores from pigeons distributed by months of the year.

Sex of birds (pigeons)	Number of cases	Number of infected cases	percentages Injury %
Males	150	70	46.6
Female	200	98	49
Total	350	168	48

The highest isolation rate was for the pattern *S. typhimurium* At a rate of 32.7%, followed by the pattern *S.typhi* With an injury rate of 28.6% *S. paratyphi* 21.4%, and the lowest was in the pattern *S. arizoinae* Reaching 17.3%. Studies indicate that the pattern *S. typhimurium* Is the dominant pattern in most countries (Maddocks *et al*., 2002, Hu *et al*., 2002).

The rate of isolation of Salmonella bacteria from faeces in Saladin Governorate is 31%. This percentage is high compared to that found by many

Table 8: shows the percentage of isolation of Salmonella spores from pigeons distributed by clinical signs.

Clinical signs of examined animals		Number of cases	Number of cases with Salmonella	percentages Injury %
Existence Clinical signs	Diarrhea	45	38	84.4
	Idle	56	20	35.7
	Breath sharp	55	15th	27.2
	More than a clinical sign	64	45	70.3
Without clinical signs		130	50	38.4
Total	350	168	48	

researchers, as the percentage of isolation of these bacteria from the stool 8%, 1% of stool samples, which is low, the reason for this decline in the level. The infection rates in the feces are due to the low level of moisture and water efficiency in the stool (Opara *et al*., 1992). The highest percentage of isolation of Salmonella bacteria in the members of the bath in the spleen was 85% followed by the pancreas by 70%, then the liver 50% and the intestines 48% compared to other members as in the Gansa, which amounted to 10%.

The rate of infection in the terrestrial bath was 38.4% and in the domestic bath (17.1%) based on the germination of the faeces, which is higher than the percentage of isolating the Salmonella bacteria from the domestic bathroom faeces. The reason is that the wild pigeons feed from the environment uncontrollably from the fields or contaminated areas, human excrement or animal waste. This increases the incidence of infection and thus isolates the Salmonella bacteria is higher than in the domestic bathroom, which is carefully nurtured.

The percentages for the isolation of Salmonella bacteria from the bathroom in the districts of Salah al-Din province

Table 4 shows isolate the bacteria salmonella from pigeons proportions and distributed to (6) districts of Salah al-Din province as to isolate the bacteria salmonella from pigeons in the city of Tikrit, the center of rates rose 60% rise significantly, followed by Samarra spend 55% and Dhuluiya 54% and decreased the proportion of the isolation of Salmonella germs in Balad district reached 40% and Al Dujail 43% while the Salmonella isolates from the bath of 51%. The reason for the high isolation in the district is the water pollution, the possibility of excessive dirt, lack of drainage or farms, high humidity and heat which make the spread of Salmonella bacteria in Place more than others (Sharp and Reilly, 1994). Table 4 shows the percentages of isolation of salmonella germs from pigeons in Saladin Governorate.

Salmonella germination isolates from pigeons are divided by age groups

The highest rate of infection of Salmonella bacteria in the age group and distributed by month in the age group 13-24 months, which amounted to 61.5%, the highest (significantly) of the other age groups, followed by the age group of 7-12 months was 58.1%. The age group of 1-6 months was 54% and the age group of 24-36 months was 52.6%. The lowest age group was between 37 and 48 months with an infection rate of 22.3%.

The results show that the highest incidence of salmonella bacteria was for the 1-24 month age group, which is consistent with the researcher's findings (Radostitis *et al*., 2007) Where the small age groups have a higher infection rate than the large age groups, these results were consistent with the study of the researcher (Harab, 2010).

The percentages of isolation of Salmonella germs from pigeons are distributed by month of the year

The study showed the existence of a clear variation in the isolation of the bacteria Salmonella ratios as the isolation ratio were affected by bacteria salmonella and reached the highest rate of isolation in March 75% and the month of April 73.3%, followed by September 68% father 59.3% and October 55.5% and November 42.8%, either in February, February and February, the rate of infection fell to 18.7% in February, the lowest percentage. The reason for this is due to the low temperature and therefore has a clear effect on the isolation of Salmonella bacteria and the high rate of isolation of Salmonella bacteria in March is due to moderate heat And the high rainfall and high relative humidity and this may light. An environment suitable for the growth and propagation of salmonella germs (Ekperigin and Nagaraja, 1998).

The percentages of isolation of Salmonella germs from pigeons are distributed by sex

The percentage of infection of Salmonella germs from the pigeon faeces was distributed according to sex. In females it was 49%. The number of isolates of female pigeons was 98 isolates from the total female sample of 200 samples, while the percentage of males was 46.6% The total number of samples (150) samples.

The percentages of isolation of Salmonella spores from pigeons are distributed according to clinical signs

Clinical signs were found on 245 birds of the pigeons.

These symptoms were characterized by diarrhea, severe breathing disorders (lethargy) and lethargy. Salmonella germs (128) were infected with pigeons, with 84.4% diarrhea, 35.7% nausea and 27.2% respiratory distress. Diarrhea has the highest incidence rate and this is consistent with the results conducted by the researcher (Mcorist and Miller, 1989). Where it is noted that diarrhea is the highest rates among other clinical signs and this may be due to different environments and the results of this study differ from the results of the researcher (Evans and Davies, 1996). He said the first clinical signs of salmonella had been signs of breathing disorder.

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