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A review on *Salmonella* bacteria in human and animal

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ABSTRACT

Salmonella (Salmonella) is a bacterium (like sticks), which is very common in nature and in many organisms. There are more than 2, 000 different species, and over 200 of them cause diseases in humans. Secondary infections are therefore possible. In general, the enemies of this virus are orally (through the mouth), through ingestion of contaminated food and / or water. This germ can contaminate food and poison it in a way that affects thousands of patients. Salmonella infections in poultry are responsible for many acute or chronic disease cases. Three forms of the disease are taken. The first is the salmonella pullorum and salmonella gallinarum. Salmonella gallinarum causes chicken typhoid, but it rarely causes inflammation of the bowel in humans. Absolutely a systemic infection of experimental lab animals.

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INTRODUCTION

Salmonella pullorum is the second type that is specialized in the host. It affects the poultry and causes the disease of the plurum disease, and the percentage of losses ranged from (100-0%) depending on the age, herd feed and administrative factors and the highest percentage of losses occur at the age of (2-3) For healing birds, they remain carriers of pathogens (Brands *et al.,* 2005; Bemis *et al.,* 2007).

The second type of Salmonella infection is Paratyphoid infection caused by the Salmonella bacteria, which are isolated on a wide range of living organisms such as mammals, birds, reptiles and insects, and that the interrelationship between these precursors makes it very difficult to get rid of the final problem. Poultry is one of the most important sources or Salmonella stores related to the occurrence of epidemics in humans (Callaway *et al.,* 2008; Barrow *et al.,* 1987).

Typhoid fever is the source of health problems in many regions of the world, with nearly 16 million cases of 600, 000 deaths per year. *S. paratyphi* is one of the most common serotypes of human infections. *S. paratyphi* is a serotype of A, BC, which is specialized in human infection. In general, *S. paratyphi* is transmitted through the stool, and the result is that the infection occurs. When eating food contaminated with waste, especially in places lacking sanitation, as this situation is common in developing countries where the sewage is poor discharge and the result that washing or preparing food will be in direct contact with contaminated water, Salmonella can be transmitted between people as a result of lack of health care (Christensen *et al.,* 1992).

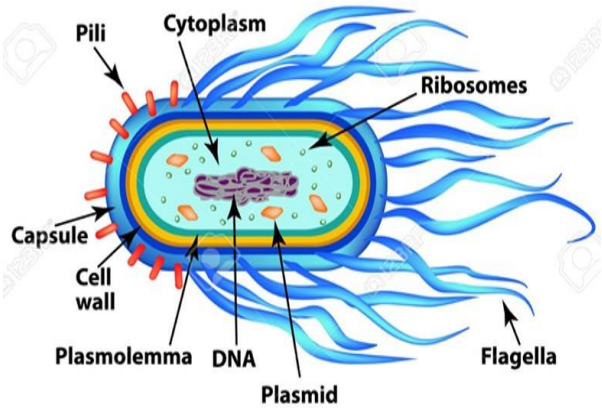

Figure 1: Structure of salmonella

Sources of Salmonella bacteria

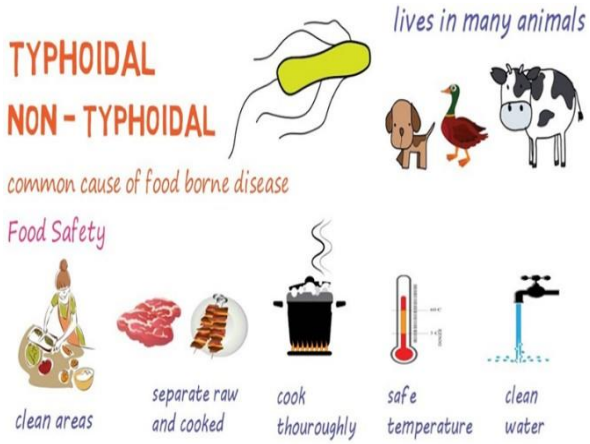

Figure 2: Salmonella

Salmonella bacteria live in the digestive tract of humans, animals and birds, and spread to meat, tools and hands during slaughter and subsequent trading. It is usually infected by humans after eating meat and other contaminated foods. This type of bacteria can survive if the contaminated product is not cooked or its internal temperature during cooking has not reached the safe level. Food can be exposed to salmonella bacteria when they are traded by people who have no interest in cleanliness in general and clean their hands after using the toilets in particular. One of the most severe types of infection is the pollution caused by the mixing of some discrete liquids from uneaten poultry meat with ready-to-eat foods. Therefore, it is always recommended to wash hands with soap and water for those dealing with food, especially people with diarrhoea or even dealing with reptiles and birds even if they are healthy. Symptoms of the disease appear (Coburn *et al.,* 2007).

Salmonella causes many diseases such as typhoid and food poisoning. This type of poisoning requires the entry of bacteria with food (especially poultry meat) to cause poisoning, i.e., food infection, and the bacteria decompose inside the intestines to release the endotoxin. Salmonella is a Gram-negative bacillus, with an orbital ocean. Fodder and drinking water in poultry fields are important sources of pollution and then human (Desmidt *et al.,* 1997).

The most important food carriers of salmonella bacteria

All raw foods, such as meat, poultry, eggs, eggs, mayonnaise, dairy products (soft cheese, ice cream, dried milk, etc.), seafood, vegetables and fruits, may carry salmonella bacteria. And the cause of the infection by not dealing with them in a healthy and safe, from processing and preparation to the stage of cooking, which must be with the temperature has reached the center of food to reduce the appropriate to eliminate all the stages of the living bacteria, in addition to be careful to avoid there is a provision for between foods with raw food That or poultry is cooked to prevent the transmission of these bacteria and the occurrence of what is known as pollution-aqueous (Giannella, 1996).

Symptoms of Salmonella infection

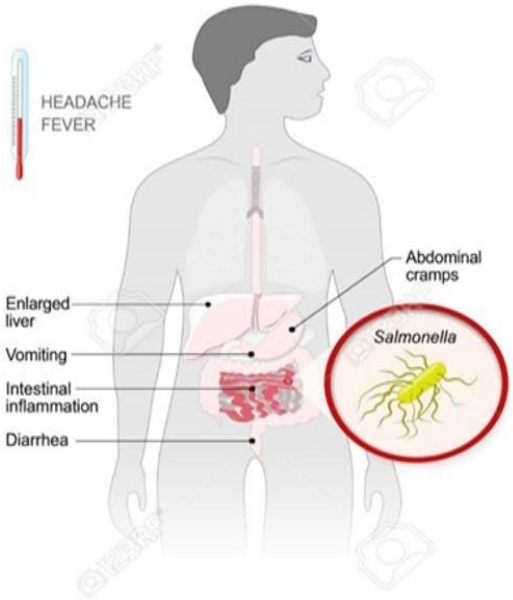

Figure 4: Salmonella infection

There are many different symptoms that can predict the risk of exposure and infection Salmonella, but the most common is the onset of signs of severe diarrhoea, accompanied by high temperatures, in addition to the constant sense of thirst, as a result of the loss of the body to large amounts of water due to high temperature and sweating (Hensel, 2009).

Prevention of Salmonella Infection

Salmonella bacteria are found in contaminated foods and do not have to show signs of corruption as a change in odour, texture or colour. To prevent salmonella infection in factories, homes, restaurants or elsewhere, bacteria should be prevented from growing and multiplying to large numbers, if any. Food must be cooked enough to kill the microbe and follow the guidelines for safe food preparation as follows:

1) cleaning and washing hands and surfaces:
   a) Wash your hands with warm water and soap for 20 seconds after using the toilet or before preparing the food and before eating it.
   b) Wash pots, slabs and dishes with hot water and soap after each step of preparation.
   c) It is preferable to use paper towels to clean the kitchen surfaces, preferably washing

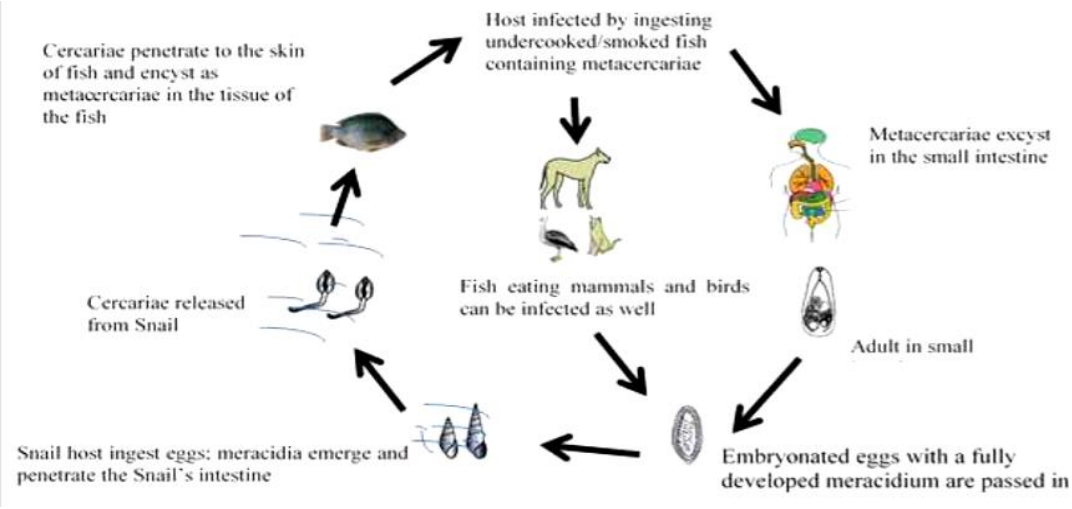

Figure 3: Food carriers of salmonella bacteria

cloth towels with hot water in the washing machine after each period of specific use.

2) Separation of food
   a) Un-cooked meat, poultry and seafood should be separated from other foods in the shopping cart and also in the refrigerator.
   b) Meat and poultry cutting tools, which are different from the cutting tools used with other agricultural products, should be used for washing and cleaning after each use to avoid cross-contamination.
3) Good cooking for food
   a) Use the thermometer to measure the temperature of the food and make sure to clean it when measuring the temperature of the internal meat and poultry and other foods to ensure that the temperature in the centre of food has reached the minimum safe to eliminate the bacteria Salmonella is as follows:
      i) Beef, calves and lambs 71-77 ° C (half-level or very high).
      ii) Minced meat 71 m.
      iii) Whole chicken 82 m (not stuffed or stuffed).
      iv) Chicken pieces 77 m.
      v) Minced chicken 80 m.
      vi) Fish of 73 m.
4) Good food preservation
   a) Refrigerated and frozen foods should be stored properly. Refrigerators must be between 3 and 5 m. Fryers should be under 18 m.
   b) Refrigerated food should be kept at a temperature not exceeding 4°C, and hot food should be kept at a temperature of not less than 60°C.
5) 5 - Tossing frozen meat in the appropriate way: Frozen meat and poultry should either be placed in the refrigerator long enough to be flattened or flattened directly using the microwave or direct rapid cooking to minimise the risk of contamination and microbial growth and should be avoided at room temperature (Al-Grawi and Al-Awsi, 2018).

Figure 5: Prevention of salmonella infection

Typhoid fever

Typhoid fever is known as typhoid, one of the most common infectious diseases in the world, transmitted by polluted foods and beverages, or by swimming pools; because they are bacteria that grow and multiply in water, and can live in milk and dairy products, so usually spread in the summer (Henzler *et al.,* 1994).

Typhoid is a serious bacterium called salmonella. It is common in developing countries due to lack of health awareness among individuals. It is said to be transmitted from infected persons, especially those working in restaurants, due to lack of hygiene, neglect of hand washing or the preparation of contaminated food. From the hands of the injured, and lives in the bag of the gallbladder in the infected, and is usually diagnosed by taking a sample of the patient's faeces, and examination, and

through the procedure Vidal test, which reveals the presence of antibodies, in addition to taking a sample of bone marrow (Oliveira *et al.,* 2003).

Method of typhoid fever

Typhoid fever reaches the intestine, penetrates the intestinal mucosa, reaches the tissues behind it, and then proliferate when the immune system cannot control it, reaching the blsoodstream, leading to the emergence of the first symptoms of fever, it can penetrate the channels Gallbladder, bone marrow and liver, where the secretion of germ secretions in the intestine, penetrates the immune tissues of the small intestine, and symptoms begin to appear on the stomach (Kimura *et al.,* 2004).

Symptoms of typhoid fever

- Increase body temperature.
- Feeling general tired.
- Acute pain in the abdomen.
- Decreased appetite.
- Long-term fever.
- Swelling of lymph nodes.
- Infertility.
- Diarrhoea.
- Pain in the bones.
- Congestion in the chest.
- A pink dotted rash appears on both the back and chest.
- Inflammation of the spleen.

Complications of typhoid fever

- Blood appears in the stool.
- A hole in the stomach.
- Myocarditis.
- Pancreatitis.
- Pneumonia.
- Gallbladder inflammation.
- Kidney inflammation.

Blood poisoning

- Unconsciousness.
- Cramps.
- Bone and joint inflammation.
- Peritoneal peritonitis, the membrane surrounding the internal abdominal organs.

Prevention of typhoid fever

Hygiene awareness and the need to wash hands before and after eating. Preference for food stored on open food. Stay away from public swimming pools; they are susceptible to pollution from sewage. Preventive vaccination should be taken if you experience any of the above symptoms. Provision of potable water. Eat well-cooked foods. Attention to personal hygiene. Wash vegetables and fruits thoroughly (Rodriguez *et al.,* 2007).

The Best treatment method for salmonella

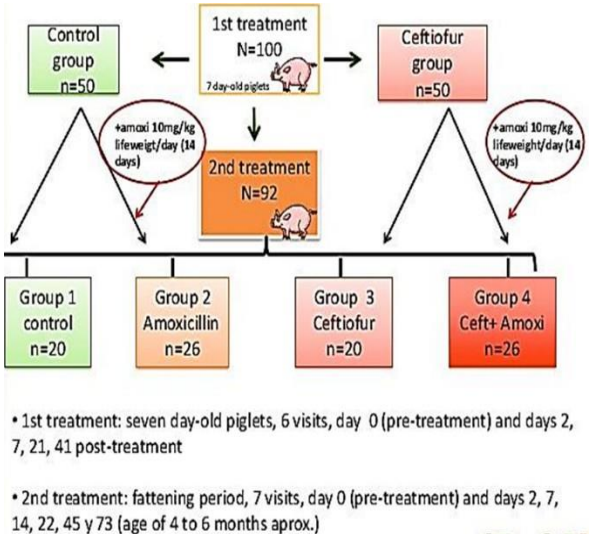

Figure 6: Treatment method

The primary treatment for patients with diarrhoea due to salmonella is the return of fluids and salts. The disease disappears without treatment in most cases. Most patients with diarrhoea due to salmonella are not diagnosed, and the condition is not characterised by complications. Various studies have not found it useful to give antibiotics to patients who have a healthy immune system for diarrheal diarrhoea. This has not shortened the duration of the disease, improved diarrhoea or shortened fever. Therefore, antibiotic treatment for diarrheal sufferers due to salmonella who have no severe accompanying disorders and children older than 1 year is not recommended, with mild to moderate symptoms of the disease. Antibiotics are recommended for patients with very severe diarrhoea (more than 9-10 daily dosing), high fever or hospitalisation, as well as patients whose immune system is inhibition (for those receiving steroids, transplants, AIDS patients). Antibiotics are amoxicillin (oral) or rousephine (intravenous). Even after the disease disappears, the patient has no symptoms; it is very common to find Salmonella secretions in the stool. On average, bacteria remain in the faeces for 5 weeks. In children under the age of 5, the bacteria remain on average for seven weeks, and in few of them, Salmonella may continue to secrete for more than a year. Antibiotics are not recommended for patients, especially after studies have shown that antibiotic therapy, on the contrary, may prolong the secretion of bacteria in the stool. Most cases of salmonella infection occur through contaminated foods (especially eggs and poultry), but in a small fraction of cases, the infection may occur by animals or by contact with contaminated faeces. So, I do not know why you decide to give your son the Flags. Antibiotic treatment in cases of salmonella infection is unnecessary and

ineffective, and the acceptable treatment with antibiotics is not the phage. However, it is possible that antibiotics have been given for another reason (e.g., to find Giardia parasites in the stool) (Saif *et al.,* 2003).

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