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Statistical Study of Brucellosis in Dhi-Qar City

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Abstract: The infectious illness known as brucellosis is brought on by the gram-negative Brucella bacteria. The present research aimed to: a) examine individuals afflicted with Malta fever over the period of 2018 to 2020, focusing on the illness's etiology, risk factors, modes of transmission, symptoms, diagnosis, prevention, and therapy. b) Research how age and gender affect the Brucellosis epidemic in Nasiriya City; c) Analyze the proportion of patients who recover and gather information on the incidence of morbidity and death. The Dhi Qar Health Department's Public Health Laboratory's Communicable Diseases Division is where the data were gathered. The results showed that there were 7, 43 cases in total between 2018 and 2020, and that age and gender had a discernible impact on the disease's morbidity rate in Nissiriya City. Furthermore, the findings showed that the mortality rate was not higher than 2%. concluded that public hygiene could manage the infection and it was not dangerous.

Key points: Malta fever; Brucella; Brocellosis; Infectious.

Introduction

The bacterium genus Brucella is the source of the zoonotic illness known as brucellosis (Wyatt, 2014). Humans may get the germs from animals by inhaling aerosols, eating contaminated food items, or coming into close contact with diseased animals. The illness is very ancient and has been referred to by a number of names, such as undulant fever, Mediterranean fever, Malta fever, and gastric remittent fever. Although humans are unintentional hosts, brucellosis remains the most prevalent zoonotic infection and a serious global public health problem.

Small, rod-shaped (coccobacilli), Gram-negative, nonmotile, nonspore-forming bacteria are known as Brucella species (Peck et al., 2019). As facultative intracellular parasites, they cause chronic illness that often lasts a lifetime. Humans are infected by four species: B. suis, B. canis, B. melitensis, and B. abortus. Compared to B. melitensis, B. abortus is less virulent and mainly affects cattle. B. canis impacts canines. The most invasive and virulent species is B. melitensis, which mostly infects goats but may also infrequently infect sheep. Pigs are the primary host of B. suis, which has an intermediate virulence (Mantur et al., 2010).

Isolating the organism from blood, bodily fluids, or tissues is necessary for a definitive diagnosis of brucellosis; nevertheless, in many situations, serological testing may be the only accessible diagnostic technique. Compared to B. suis or B. melitensis, B. abortus is less usual to have a positive blood culture yield, which varies from 40 to 70%. A number of methods are available for identifying specific antibodies against bacterial lipopolysaccharide and other antigens, including the rose bengal, 2-mercaptoethanol (2-ME), antihuman globulin (Coombs), standard agglutination test (SAT), and indirect enzyme-linked immunosorbent assay (ELISA). In endemic locations, the most often utilized serology is SAT (Franco MP et al., 2007).

Human brucellosis is often linked to occupational exposure of laboratory personnel, veterinary professionals, and slaughterhouse workers, as well as intake of unpasteurized milk and soft cheeses derived from the milk of diseased animals, mostly goats, infected with B. melitensis (Wyatt, 2005).

Certain vaccinations used on cattle, most notably strain 19 of B. abortus, may also infect people if they are inadvertently administered. Frequent fevers, miscarriages, perspiration, weakness, anemia, headaches, melancholy, and physical and muscle discomfort are all symptoms of brucellosis. Dogs and pigs are infected by the other strains, B. suis and B. canis, respectively.

Overall, the research indicates that goat farmers are at work risk from brucellosis. Of particular worry are goat farmers' little understanding of safe farming methods like quarantine and their lack of awareness of the disease's potential to spread to people (Peck ME et al., 2019).

Aims and objectives and Programmed of work

This study's main goal was to investigate the brucellosis epidemic that occurred in Nasiriya three years ago. It also collected patient data from the city and examined the impact of a number of variables, such as age and gender, on the disease's severity..

Literature review

Bacteria belonging to the genus Brucella are the cause of the infectious illness brucellosis. Gram-negative, aerobic coccobacilli are called brucella. As a zoonotic illness, brucellosis mostly affects animals but may sometimes sporadically spread to people. Several terms have been used to refer to brucellosis, including Bang's sickness, Crimean fever, undulant fever, Mediterranean fever, and gastric remittent fever. Elk and bison are examples of wild species in North America that have brucellosis, although it may also sometimes be seen in domesticated animals including cattle, pigs, sheep, and goats. The principal species of the genus Brucella that are linked to sheep, pigs, cattle, and dogs, respectively, are B. melitensis, B. suis, B. abortus, and B. canis. According to Al-Sous MW et al. (2004), B. suis and B. melitensis are the most pathogenic (prone to cause illness) species.

A zoonotic illness, brucellosis is an infectious disease mostly seen in animals but also capable of infecting people. The bacterium that causes the disease is called Brucella. The germs causing brucellosis were ultimately discovered in 1887, but the illness has been known to affect humans since ancient times and is mostly limited to animals. The bacterium has been classified as a possible biologic weapon because it may aerosolize. The bacterium that causes brucellosis is called Brucella, and it may enter human bodies via incisions in the skin, mucous membranes, inhalation, and consumption of tainted meat or other foods produced from animals. The bacteria can live within human cells and spread to a variety of organs. Consuming unpasteurized milk or cheese, as well as having a strong relationship with animals (farmers, vets), hunters, and meat processors, are risk factors. Human-to-human transmission of brucellosis is very uncommon; instead, it is transmitted to people via milk, meat, or cheese derived from infected animals (Radostits, 2000). The patient's medical history and physical examination are used to make a preliminary diagnosis of brucellosis, which is confirmed by culture of the patient's bacteria. Antibodies to the virus may also be detected by blood testing (Wilkinson, 1993).

1- Causes

Bacteria are the cause of brucellosis. The gastrointestinal system, respiratory tract, conjunctiva, breaks in the skin, and mucous membranes are all possible entry points for the brucella bacterium into the human body. Regretfully, these organisms can tolerate some degree of survival inside the body's cells, including various cell types (Ettinger, 1995). The lymphatic system in human cells and the circulation may both carry these germs to other organs. Infections may affect any organ system, and they can be localized or systemic (affecting the whole body). Additionally, the bacteria are capable of replicating inside their hosts' cells and escaping when the cell dies. These germs continue to infect further human cells..

2- Incubation period

The duration of incubation for brucellosis varies greatly; it can last anywhere from five days to five months, and some patients report that their incubation period has lasted up to a year. On average, the incubation period is between two and four weeks (Lehane & Robert, 1996).

3- Brucellosis spread

The most prevalent route for people to get brucellosis is by consuming raw or unpasteurized dairy products. The milk produced by sheep, goats, cows, and camels that are afflicted with Brucella is tainted with the bacterium. Inhaling the germs is another method that brucellosis spreads among people. Workers in meat processing facilities may be exposed to the bacterium by inhaling droplets from infected meat, even though this danger is often linked to those who work in labs researching Brucella organisms (cattle, sheep). Humans may potentially get infected with the bacterium via mucous membranes or skin breaches. Hunted species that are often afflicted and may harbor Brucella include bison, elk, caribou, moose, and wild pigs. Although it is uncommon, brucellosis may spread from person to person by intercourse, blood transfusions, transplacental transfers, or even contact with menstrual blood.

The human form of brucellosis is contracted by consuming milk and its byproducts contaminated with bacteria; the animal form of brucellosis is contracted by direct contact with an infected animal, which includes touching its meat or skin, breathing in or smelling the bacterial spray from the animal, consuming raw milk, or consuming dairy products contaminated with the bacteria from the infected animal. Consequently, those whose line of work necessitates handling animals—such as farmers, veterinarians, and butchers—are thought to be the most susceptible to brucellosis.

A frequent ailment that strikes in the winter and spring is brucellosis. There is an incubation period of one to three weeks.

Except under very unusual circumstances, such as unprotected sexual contact or transmission from mother to child (via nursing or childbirth), brucellosis is extremely uncommon to spread from person to person.

4- Symptoms and signs of brucellosis

Numerous symptoms may be caused by brucellosis. While some symptoms may manifest quickly, others may take a while to manifest. The following are examples of first or early symptoms: fever, exhaustion, sweating, back discomfort, pain in the muscles, joints, and/or abdomen, appetite loss, weight loss, headache, and enlarged lymph nodes.

As the illness progresses, there may be frequent fevers accompanied by chills, a worsening of joint discomfort, and organ enlargement that affects the heart, testicles, liver, and/or spleen and impairs their ability to function. Some individuals may get skin rashes and/or subcutaneous granulomas, which are tiny skin abscesses. Patients may also have neurologic problems, sadness, and persistent weariness. Most individuals don't exhibit symptoms for two to four weeks (the latent phase) after their first exposure (Naudi, 2005).

Brucellosis treatments

While brucellosis may be treated by the patient's primary care physician (including internists and family practitioners), it is common practice to contact infectious disease experts, neurologists, rheumatologists, and travel medicine specialists about the management and/or prevention of this illness. Depending on which organ system is most affected, other experts (such as urologists and obstetrician-gynecologists [for infected pregnant women]) may be contacted in cases of severe infections (Mantur et al., 2010).

The CDC recommends that patients with infections be treated with a combination of rifampin (Rifadin) and doxycycline (Vibramycin, Oracea, Adoxa, Atridox) for a minimum of six to eight weeks (Ranglack et al., 2015). The organism's capacity to persist within human cells accounts for this lengthy treatment duration; as a result, the CDC advises that a definitive diagnosis be made prior to starting a long-term antibiotic regimen. Most of the time, pregnant patients and those with compromised immune systems should get treatment after consulting with an infectious disease expert.

RESULTS

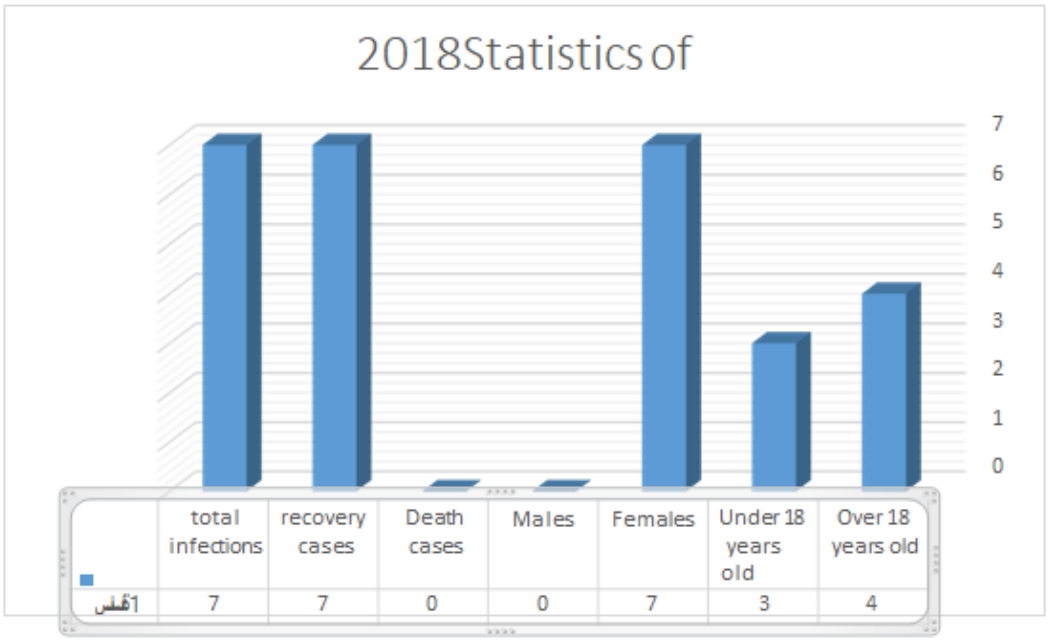
Table 1-2 shows the numbers of cases of diagnosed brucellosis depending on the laboratory and clinical diagnosis were 7, 43 and 2 in 2018, 2019 and 2020 respectively. Also, the table showed all cases were recovery after treatment except 1 patient died during 2019 because of the complications and immunity state. The results found that the females were susaptiblity to infection more than males, on the other hand, the infection outbreak between adult increased compared to younger people less than 18 years.

Table1: Statistics for 2018-2019-2020

:NO	total infections	recovery cases	Death cases	Males	Females	Under 18 years old	Over 18 years old	Diagnostic methods
2018	7	7	0	0	7	3	4	‹Clinical Lab
2019	43	42	1	18	25	11	32	‹Clinical Lab
2020	2	2	0	0	2	0	2	‹Clinical Lab

Discussion

The statistics for the three years, 2018-2019-2020, were obtained from the Communicable Diseases Division in the Public Health Laboratory, and the results showed each of the three years: In 2018, there were seven infected with Malta fever and also there were clear signs that they showed, including high temperature and pain in the body and especially the joints, also vomiting, which is a symptom that all those infected with Malta fever shared. But some of them caused the injury to lose weight.



Figures 1: Statistics of 2018

Among the injured for the year 2018, all of them recovered, but with the passage of a period to finally get rid of the symptoms that they had and all of the injured for the year 2018 were women, and the diagnosis was made by laboratory and clinical analyzes.

Where the pink Bengal dye was used.

Four of the wounded were older than eighteen, and three were less than eighteen.

There were 43 instances in 2019—25 females and 18 males—of whom 42 recovered and one patient passed away as a result of complications. There were also 11 cases under the age of 18 and 32 cases over the age of 18. Numerous symptoms of brucellosis might be confused with those of other illnesses as well as those specific to the disease. Among these signs and symptoms:

High temperatures and profuse perspiration, particularly at night, that continually vanish and reappear

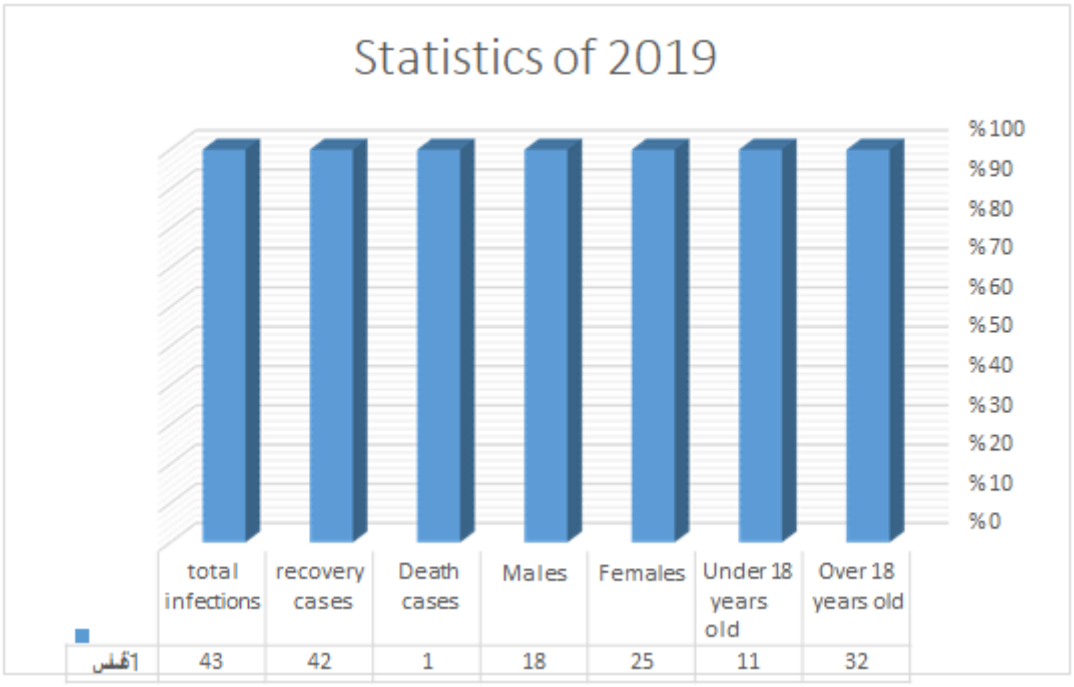
Headache.

Brucellosis, back pain and joints.

The joint may become inflamed, and the patient may feel pain and swelling in the joint,

and move to another joint after the improvement of the first joint. It is worth noting that the most vulnerable joints are the knee, hip, shoulder, ankle, wrist and vertebrae.

Feeling fatigue, general fatigue, and lethargy (Autumn R,2020).



Figures 2: Statistics of 2019

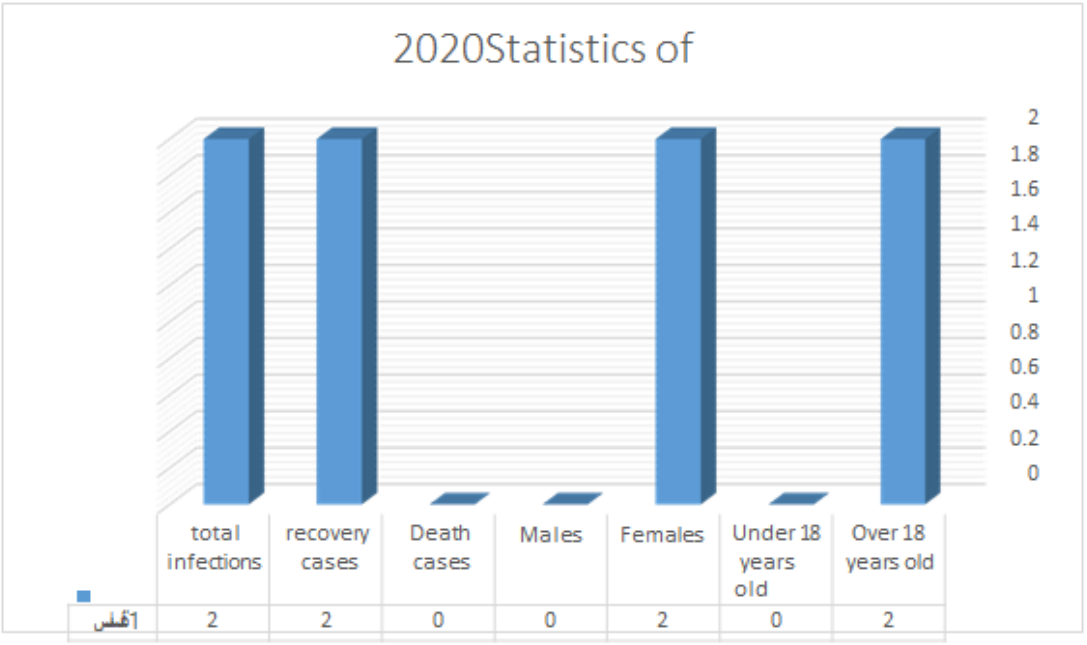
As for the year 2020, as shown in the chart below, two cases were diagnosed with brucellosis, and no death was recorded, and these two cases were females and all of them are over the age of 18 years. In some cases, antibiotics may be ineffective in treating brucellosis despite adherence to the specified doses. As a result of the presence of resistance from the pathogenic bacteria to these treatments, in this case the disease can develop in the infected person to:

swelling throughout the brain.

Bones and joints develop lesions.

Meningitis.

The inner lining of the heart's chambers and valves is called endocarditis. Wafa (2020).



Figures 3: Statistics of 2020

All cases of brucellosis were clinically and laboratory diagnosed, and in some cases there were complications, but they were controlled by good nutrition and following the doctor's instructions.

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