Introduction

Salmonella spp. are the most common causes of foodborne illness in humans and animals (Takele et al., 2015). Nontyphoidal Salmonella enterica (NTS) diseases are a major load to global common health, as they lead to infections ranging from gastroenteritis to the systemic manifestations for salmonellosis, to facilitate systemic infections, intracellular Salmonella existing in the immune cells like macrophages and dendritic cells (DCs) may be transported from the intestinal tracts to other regions of the body (Sundquist et al., 2004; Shallal, 2016). Salmonella enterica serovar Typhimurium is foodborne pathogens causing inflammatory diseases in the intestinal tract following diarrhea and is in charge of thousands of deaths worldwide (Schulte and Hensel, 2016). So this study was designed to evaluate the LD<sub>50</sub> and ID<sub>50</sub> by using white BALB/c mice as an animal experimental model.

Materials and Methods

Bacterial isolates:

Salmonella typhimurium isolate was provided by the public health Zoonotic Diseases/ College of Veterinary Medicine/ University of Baghdad. From 6 years old child suffered from diarrhea for more than 7 days.

Experimental mice:

The study was carried out in the animal house in the Veterinary college/ University of Baghdad in Iraq A total of 48 mice (BALB/c) of both sexes with age from 6 to 8 weeks old, were used in the present study were adapted for two weeks before started the experiment by reserved in separated clean and sterilized cages, they were fed on pellets and clean water. Then divided randomly into 8 groups each with 6 mice. The seven groups of mice administrated orally with one of the calculated (CFU/ml) diluents by using needle gavage about (0.5ml) and the eight groups administrated phosphate buffer saline (PH=7.2) and deemed as a control group. The result evidenced the LD<sub>50</sub> was (1x10<sup>8</sup> cells) and infective dose (ID<sub>50</sub>) was (1x10<sup>6</sup> cells).

Keywords: Salmonella typhimurium, lethal dose (LD<sub>50</sub>), infective dose (ID<sub>50</sub>)

Results

Each five colonies of Salmonella Typhimurium was inoculated in the (10ml) of the Brain heart infusion broth situated at 37 °C for (18hrs) then centrifuged in the cooling centrifuge (8000rpm) round per minute for (15minutes) then the pellet later washing three times with phosphate buffer saline (PH=7.2) and suspending by using (1ml) of PBS (PH=7.2), The suspension was diluted by ten-fold dilution (10<sup>-1</sup>, 10<sup>-2</sup>, 10<sup>-3</sup>, 10<sup>-4</sup>, 10<sup>-5</sup>, 1111 10<sup>-5</sup>, 10<sup>-6</sup>, 10<sup>-7</sup>, 10<sup>-8</sup>, 10<sup>-9</sup> ). The viable count of bacteria in each diluent was formed according to the manner of (Miles & Misra, 1938).

Statistical analysis:

Chi square was administered to decide the statistical differences among tested groups by applying SPSS statistical program.

Discussion

The result of lethal dose (LD<sub>50</sub>) and infective dose (ID<sub>50</sub>) in mice was (1x10<sup>6</sup> CFU/ml) and (1x10<sup>5</sup> CFU/ml) respectively which estimated by observant the dead and live mice in each group during 30 days of the experiment showed in a table (1).
The infective dose of *Salmonella typhimurium* was approached to that referred by (Blaster & Newman, 1982) which mentioned that the infective dose range between 10^-5 to 10^-3.5 cells.

The result of the lethal dose (LD50) in the experimentation of this study compatible with a study of (Al-saadi, 2013) who listed the LD50 of *Salmonella Hadar* in the mice was (1x10^6 CFU/ml). The LD50 of this study was high dose when equated with that referred by (Yousif, 2000) and with (Al-Hashimi, 2005) who recorded the LD50 of *S.enteritidis* in mice was (1.4x10^6 CFU/ml). Other studies listed high LD50 number such as (Al-Mansory, 2009) who establish that LD50 of *Salmonella enteritidis* in the rabbit was (2x10^6 CFU/ml) and with (Al-Naqeeb, 2009) who found that the LD50 of *Salmonella Hadar* in mice was (1.5x10^6 CFU/ml) and also with (Shallal, 2011) who recorded the LD50 of *Salmonella mbanda* in mice was (1.3x10^7 CFU/ml).

It could be concluded those data showed that it requires a very low number of microorganisms to cause diseases in young children, the older and immune-compromised persons. As it is apparent from the result noted above, *Salmonella typhimurium* did not vary from other nontyphoidal *Salmonella* spp. for this study involved criteria, which means that *Salmonella typhimurium* have the like virulence for the mice administrated orally.

### References


