Stomach hyperplasia in dog association with salmonellosis

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Abstract:
The inoculation of Salmonella typhimurium for dogs to show its effect on their stomach, that all dogs became severely ill following inoculation, also all animals were die during one weak.

The histopathological changes showed mucosal metaplasia which included; sever vaculation of mucosa and increased mucous glands at the base of lamina propria due to site of entry of Salmonella, as well as the increased number of mucous gland which give the secretory area of stomach as finger like projection, also in other section showed as intestinlization. In other part of stomach mucosa showed atrophy, and appear cystic dilatated mucus glands.

Moreover, lesion included the thickened muscularis and pyloric region with edema in sub mucosa, also the mucosa of the fundus and pyloris showed inflammatory cell infiltration following salmonellosis.

Introduction:
Salmonellosis: was an economically important disease of all animals. The infection occur worldwide by more than 2375 serotypes of Salmonellae (1).

Salmonella spp. may concluded in three main groups, first one was human specific as in S. typhi and S. paratyphi, second group consist of serotypes that adapted for specific animals host examples S. duplin in cattle, while the third group included the non host adapted serotypes; S. typhimurium, which occur most often and widely distributed than any other types as well as its most important zoonotic diseases in developing countries (2). Salmonellosis had an economically important in farm animals also in dog and cat (3,4, and 5).

The sub clinical Salmonella infection in dogs was recorded in ratio of 52% (6), whereas the hazards of carrier state was related to transmit the infection to man (7,8 and 9). Whatever many clinical illnesses characterized by septicemia and enteritis, which manifested by diarrhea usually with hemorrhage, as well as vomiting, fever, depression, abortion and the death as fate for young puppies (10,11 and 12).

The present study was aimed to exert the effect of salmonellosis on stomach of dogs.

Materials and methods:

The experiment was done by using ten puppies (local breed), they were aged between (2-4) months old from birth, and weighed between (3-4.5) kg. The dogs adapted for experiment for two weeks, during that time had therapy as follow; Ciprofloxacin in dose of 20mg/kg B.W daily for six days, while given Ivermectin of 0.2 mg/kg B.W by S/C in one dose, and Niclosamid of 50 mg/kg B.W (13).

The experiment designated as following:

The dogs were divided into two equal groups which consist of five puppies for each.

First group as Control:

The animals of this group were inoculated orally with 10 ml of sterile trypsicase soya broth.

Second group (Infected group):

The animals of this group were inoculated orally with 10 ml of trypsicase soya broth which contain (1x10^9) CFU of S.typhimurium per ml as infected group (laboratory of clinical pathology–college of veterinary medicine- university of Basra). Postmortem examination was done after the death of the experimentally infected (second) group.

The specimens for histopathologic examination were collected from funds and pylorus stomach, preserved in 10% formalin for preparation and sectioning according to Luna (14).

Results and discussion:

The effect of Salmonella typhimurium on dog stomach was represented by second group of present experiment, which showed
clinical illness following inoculation, that lead to death for all of 5 dogs of the group during a period of week, the most morbid puppies following salmonellosis were related to septicaemia and septic shock (3). Then the post mortem resulted the followings:

The severely congested stomach showed histological findings such as sever vaculation of mucosa and increased mucous glands at base of lamina properia (figure-1). Such findings were associated with site of bacterial entry such as Salmonella (15 & 16). Other way the pathogen may pass through the pylorus to the small intestine then after rapidly penetrated the mucosal epithelium to reach lamina properia then subsequent infection by descending to stomach, that due to gram negative bacterial affinity against receptor mediated endotoxin (17).

The figures (1 & 2) appeared increased number of mucous gland which gave secretary area of stomach a finger like projection in relation to sever injury following bacterial multiplication at the lamina properia which also described by Schachter (18). The obvious hyperplasia of mucosa and vaculation may made stomach thicker mucosa than normal due to those projections, which gave signs of intestinalization upon stomach mucosa, that mean hyperplasia was occur following infection (16&19).

In some other section there were atrophic mucosa, cystic dilatation of mucus glands , with cellular debris and few inflammatory cells (figures 3, A & B), those histopathological changes may followed sever damage on stomach mucosa, which also recorded in relation to bacterial product such as toxins (18&20,).

Other lesion included the thickened muscularis externa (figure 4), also explained by previous authors in response to Salmonella spp infection and subsequent hypertrophy in chronically damaged muscle, then that change was replaced by masses of fibrous tissue, or may due to fascial thickening (21).

More over there were vaculation and prominent ganglia (figures 5 ) which explained by Jubb et al, (19) and Cunningham, (22) as response to sever microbial infection.

Pyloric region showed edema in sub mucosa and increase number of inflammatory cells (figure-6 ), that endotoxin of gram negative bacteria caused activation for permeability and inflammatory cells aggregation (17& 23).

The control group showed at normal limit during clinical and pathological observation of the study.
Figures (1): stomach mucosa, fundus region, showed severe vaculation and increased number mucous glands (stare). (H&E) x100

Figures (2): stomach mucosa, fundus region, showed increased number mucous glands (stare), and appearance of finger-like projections (arrow) (H&E) x200
Figure 3: Stomach of dog, showed atrophic mucosa with cystic dilatation (star) and inflammatory cells infiltration (arrow). (H&E)
Figure (4); stomach of dog, their was thickening of muscularis (stare), (H&E x50)

Figure (5); stomach of dog, sever vaculation of mucosa (arrow) and prominent ganglia (star). (H&E x400)
Figure 6: Stomach of dog. Pyloric region shows edema in sub mucosa (arrows) and infiltration of inflammatory cells (star). (H&E) x100

References:


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