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Histological and Histochemical Detection for the Gastric gland in Neonatal Wild Rabbit (Oryctolagus Cuniculus) in Iraq

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ABSTRACT: The importance of this study to detection for the gastric gland in neonatal wild rabbit. Ten neonatal wild rabbit are collected from the Wasit city markets which divide into two group, first group include five animals in 5day, second group include 5 animals in 10 days. Animals were deeply anesthetized with intramuscular injections of ketamine and xylazine, then slaughter were done. uptake 10 tissue specimens from stomach then cut into 3 parts cardiac, fundus, and pyloric, routine histological procedure to prepare histological slides. This study showed the stomach wall in neonatal was consist of tunics; mucosa, sub mucosa, muscularis & serosa. Mucosa surface lining by simple columnar (S.C) epithelium .it showed increase in thickness tunics of wall stomach with the progressive of age. Three types of stomach glands appear in wall of stomach and raise with the old progress. As bifurcated tubular spiral short gland in the first and third glands zone while in second glands zone they appear as simple bifurcated tubular long straight over most of their length and spiral at base portion, The cardiac glands zone revealed as composed of the prominent cells mucous secreting cells and few number of oxyntic cells which not obviously raise in numbers with age progress. The fundic glands consist of various kinds of cells but the two major cells are oxyntic & peptic cells which very mild raise in numbers with the old. Pylorus glands appear consist of mucous secreting cells which are the prominent cells with less numerals of oxyntic cells which not obviously raise in number with old progress

Key word: histological, stomach, neonatal, wild rabbit.

1- INTRODUCTION

The digestive system was play a vital role in food processing and absorption (1). The stomach is a significant part of the differences in the digestive system of different species. Needs vary considerably among the following animals: Herbivores, carnivores and omnivores. Species that are simple stomach are quite different from ruminants (2). In general the vertebrate stomach is an organ in the upper portion of the gastro intestinal tract between the esophagus and intestine serving a number of important functions such as its direct role in digestion by secretion of acid and enzyme (3,4), storage organ for food, milling and mixing of food with gastric secretion , regulating the amount of food reaching the intestine, the strongly acidic nature of gastric juice serves to diminish the number of microorganisms that invade the body through the mouth and one component of the juice is the intrinsic factor that promotes the absorption of vitamin B12 (5).Rabbits are a highly distributed animal species and are commonly used in the laboratory. experimental and for economic uses, It is a model of multiple medical experiments and is widely used in education, (6) Rabbits are herbivores designed to be on the diet of succulents (7). The gastrointestinal tract of rabbits is fundamentally different from the gastrointestinal tract of well-known herbivores such as horses and ruminants, which consume large amounts of food and separate digestible and fertile food particles. It also rapidly eliminates slowly fermenting fibrous waste products. There is a large absorbable surface area in the intestine (8). The stomach of the Oryctolagus cuniculus has a thin wall, is J-shaped, and is located to

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the left of the median plane.(9)This study aimed to investigate the histological aspects of the stomach of neonatal wild rabbit in Iraq to supply a good understanding of the qualitative changes in the stomach at this age.

2- METHODLOGY

2-1 HISTOLOGYICAL STUDY

Ten healthy neonatal wild rabbit are collected from the wasit city markets which divide into two group ,the first group include five animals in 5 day age the second group include 5 animals in10 day age in animal house of biology department of college of education for pure science in wasit university, Animals were deeply anesthetized with intramuscular injections of ketamine (35mg/kg) and xylazine (5mg/kg) to induce total bleeding (10) At that time the chest was opened and the right atrium was punctured for bleeding when complete bleeding dissection of animals to take the stomach immediately dip this sample into a fixed solution containing 10% neutral buffered formalin at room temperature put it in sections (5µm.) thickness of three regions from stomach (cardiac, fundic and pyloric regions) were taken. Staining tissue with Harris hematoxylin and eosin staining as the usual staining to detect common histological structures, and periodic acid-Schiff (PAS) staining to indicate the type of glands.

2-2 RESULTS AND DISCUSSION

The mucous membrane of stomach into two groups of animals were divided into three zones, the cardiac, fundic and pyloric zones according to type the glands which they contain. The wall of stomach into two groups consist from four tunics; tunica mucosa (epithelial, lamina propria and muscular mucosa), tunica submucosa, tunica musculris and the tunica serosa (Fig1). Mucosa lined by the surface epithelium, which is simple columnar epithelium (SCE), invagination to the gastric pits into the glands empty (Fig1). .

In two studied groups the cardiac zone appears as a narrow zone at the around cardiac orifice that contains the cardiac glands. The tunica mucosa lined by simple columnar epithelium (SCE) that forms a surface lining cells which extend to the gastric pits (Fig2). The mean height of epithelium was19.82 ± 0.62µm in first group and 20.36 ± 1.32µm in the second group (Table1) with P <0.05, there is no significant difference between the two study groups. The cardiac glands found in the lamina propria appear as short, branched, tubular, coiled glands with relatively long holes. The number of cardiac glands in two group was 18.62±1.45µm, 20.52±1.20µm respectively. Current studies show that the number of cardiac glands is lowest in the first elderly group and increases in the second group with increasing age. There are mucus-discharge cells and little oxyntic cells the number of parietal cells were 0.62±0.18 µm, 0.82±0.11 µm respectively in two study group and there are no chief cells in two groups of cardiac glands. (Fig2). wall structure of internal stomach in neonatal wild rabbit was same to that previously described in monogastric animals reported by (11) in guinea pigs and in some mammalian stomach (12). While various from the stomach of ruminant which have a permanent spiral fold (13) that raise the secreting surface area of mucous membrane and take large amount of food (14). The cardiac glands similar to that in guinea pigs' stomach by (11).

In fundic glands zone of studied groups mucosa and submucosa are thrown into a large longitudinal folds (rugae) which project into lumen of stomach. (Fig3). Epithelial lining cells in fundic region are simple columnar (SC) epithelium continuous to streak the shallow gastric fossa (Fig3). The mean height of epithelium was a minimum in the first group which recorded 17.28±0.44 µm in first group and 19.52±1.32µm in the second group (Table1), with P <0.05, there is no significant difference between the two study groups. Fundic glands appear similar in the two studied group, the number of fundic glands in two study groups was 20.15±1.1µm, 22.5±1.12µm respectively. These glands appear as simple bifurcated tubes that are long over most of their length, and as a complete longitudinal section of densely arranged tubules, perpendicularly to the surface of the mucosa and penetrate its whole the thickness. Each gland has a narrow lumen, constricted neck which connecting with the base of the gastric pits and blind coiled end near the muscularis mucosa (Fig4). Fundic glands contain a mixed aggregation of cells however the major cells are the oxyntic & chief cells. Parietal cells are distributed along length of the gland, however are mainly located in top bisection of the fundic gland (Fig4). The number of parietal cells were 3.94±0.26 µm,
5.94 ±0.06 µm and chief cells were 6.44±0.36 µm,8.44 ± 0.16 µm respectively in two study group. There is no difference between the histological structure of the fundic glands in neonatal wild rabbit stomach in histological structure of the fundic glands in the simple stomach in albino rats described by (15). The number of glands in the three glands zones of stomach were differ from the number of mucosal gland of ruminant may be because difference in the species and type of nutrition. The structure of fundic glands in neonatal wild rabbit's stomach set with (11,17) in monogastric animals, and the parietal cells have the same histological characteristic in the stomach of guinea pigs and mouse.

In the pyloric zone the epithelium covering the surface of tunica mucosa and lining the pits were simple columnar epithelium (SCE)(Fig3) the mean height of surface epithelial cells was 18.09 ± 1.35µm in the first group, 20.36±1.00µm in the second group (Table1), With P <0.05, there is no significant difference between the two study groups. pyloric glands in all ages are similar and they appear as simple, branched, coiled short tubular open into the deep gastric pits (Fig5). The number of pyloric glands were17.62±1.56µm, 19.62±1.16µm respectively in two study groups. The cells in

this area are mucus-secreting cells with several oxyntic cells the number of parietal cell were 0.55±0.96 µm, 0.75±0.66 µm respectively in two study group, and no chief cells are present, the mucus cells appear like cuboidal or pyramidal in shape with base position oval or spherical nucleus (Fig5). The structure of pyloric glands is like to the description of (11). The pyloric glands have mainly mucous cells with little parietal cells, this finding likes with (18) and they defined the pyloric glands zone nearby the pylorus containing mucous cells and in addition to mucous cells, parietal cells are present. The PAS dye has been used to detected the mucus-secreting cells of the gastric mucosa. This study distinguished that the surface lining cells of whole mucosa of stomach in neonatal wild rabbits that extend into gastric pits gave vigor reactivity with PAS, which look as pink or magenta color and they are considered as mucus secreting cells. The mucous cells is positive for PAS due to a polysaccharide reaction with it (11).The mucus cells protect the epithelium from gastric juice and enzymes which secreted by gastric cells (19,20). The mucopolysaccharide denote as barrier protection against acidic substance and may be main for lubrication of mucosa (18,21).

Table1. Explain the height of epithelium in three region of stomach in two group.

Number of group	Height of epithelium in cardiac region	Height of epithelium in fundic region	Height of epithelium in pyloric region
First group	19.82 ± 0.62 µm	17.28 ± 0.44 µm	18.09 ± 1.35 µm
Second group	20.36 ± 1.32 µm	19.52 ± 1.32 µm	20.36 ± 1.00 µm

Table 2. Explain the number of glands, number of parietal cells, and number of chief cells in three regions of the stomach in two groups the neonatal age of wild rabbits.

	Cardiac glands region			Fundic glands region			Pyloric glands region		
First group	Glands field	Parietal cells	Chief cells	Glands field	Parietal cells	Chief cells	Glands field	Parietal cells	Chief cells
	18.62±1.45	0.62±0.18	Nil	20.15±1.1	3.94±0.26	6.44±0.36	17.62±1.56	0.55±0.96	Nil
Second group	20.52±1.20	0.82±0.11	Nil	22.5±1.12	5.94±0.06	8.44±0.16	19.62±1.16	0.75±0.66	Nil

Figure (1) show the tunics of stomach:Tunica Mucosa (TM),TunicaSubmucosa(TS),Tunicamuscularis(Tm),Tunica Serosa(TS).H&E.X100.

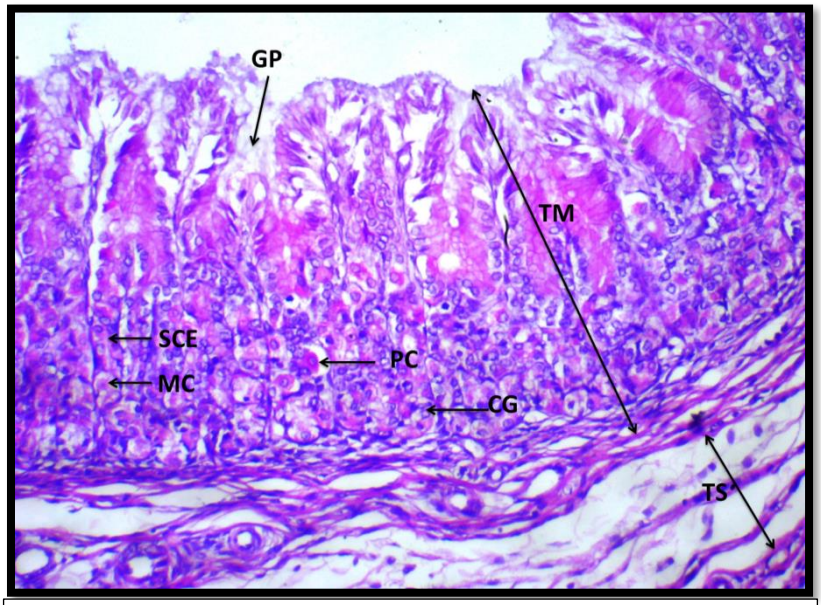

Figure (2) show the cardiac region of stomach: Gastric pit (GP), Tunica mucosa(TM),simple columnar epithelium(SCE),Cardiac Gland(CG),Mucous cell (MC),Parietal cell(PC).H&E stain.X100

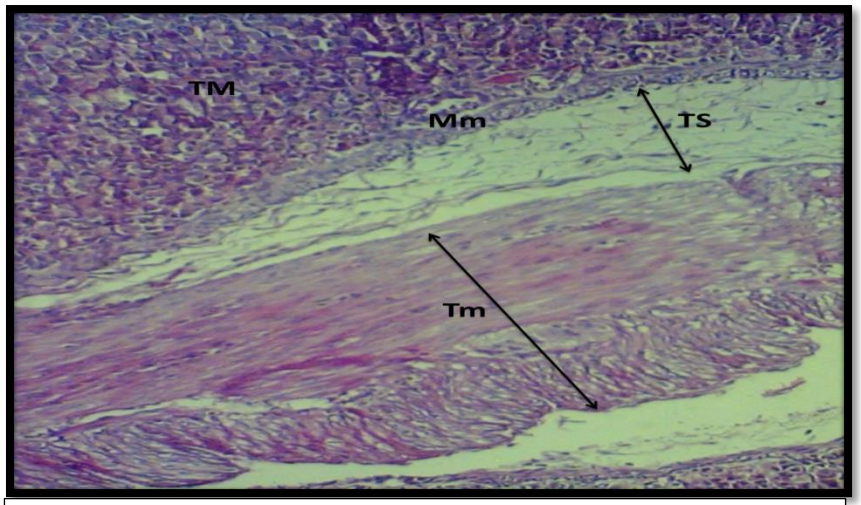

Figure (3) show the fundic region of stomach: Tunica mucosa (TM), Muscularis. Mucosa (Mm), Tunica submucosa (TS), Tunica muscularis (TM). PAS stain.X100

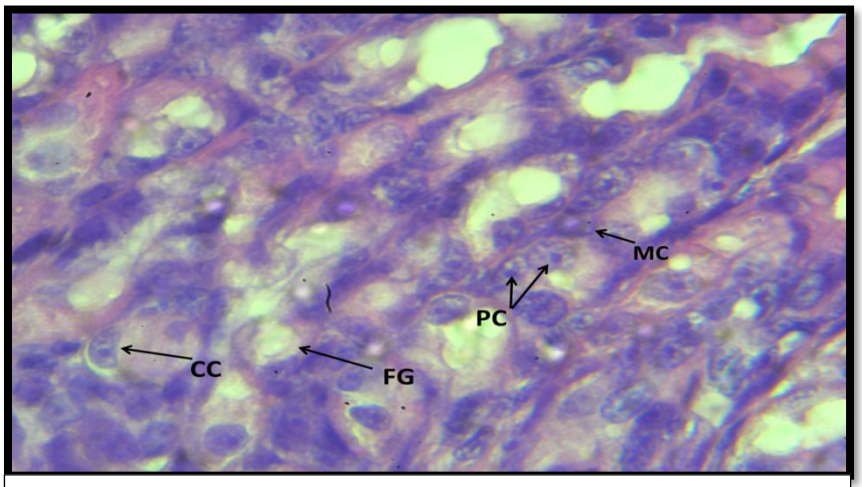

Figure (4) show the fundic region of stomach: Mucous cell (MC), Parietal cell (PC), Chief cell (CC), Fundic gland (FG), H&E stain.X400.

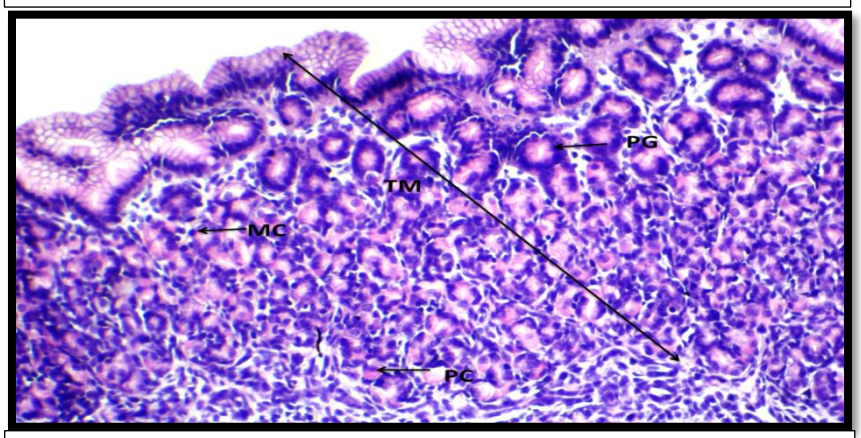

Figure (5) show the pyloric region of stomach: Mucous cell (MC), Parietal cell (PC), pyloric gland (PG), Tunica mucosa (TM), H&E stain.X100.

3. CONCLUSION

The thickness of whole tunics in gastric wall increased with old raise. A number of glands were raised with advancing age in the three glands zones. The number of parietal cells in the cardiac& pyloric glands do not obviously increase with the advanced age. In fundic glands region there is very slightly increased in number of oxyntic and peptic cells. The surface lining cells and cells composing of cardiac and pyloric glands were mucous discharge cells which positive reaction with periodic acid Schiff stain.

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