

Histological Development Of Ileum In New Zealand Rabbit(*Oryctolagus Cuniculus*) Embryos During Pregnancy, Childbirth And Lactation

Kawthar Mohammed Nasser Abboud Al Hayani ¹, Nedhal Ibrahim Lateef ^{*2}, Mahdi Saleh Shalal Al-Hiti ³

^{1,2} department of biology College of education for woman University Of Anbar/Iraq

³deparatment of human anatomy ,collage of medicine, University Of Anbar/Iraq

Corresponding AAutor: Nedhal Ibrahim Lateef E-mail: edw.nedhal_79@uoanbar.edu.iq

ABSTRACT

The histological developments in the ileum during the fetal stage, childbirth and the lactation period were studied in twelve pregnant females, where it was divided into 6 rabbits during pregnancy and 6 rabbits after birth, where 49 rabbit embryos were collected, divided into 7 embryos for each stage of pregnancy, childbirth and lactation, where the combined optical microscope was used while studying. Where the results showed the emergence of short villi covered with simple columnar epithelial cells consisting of blue-colored cystic cells scattered between gastric absorptive cells and mitotic cells and the emergence of intestinal crypts in the tunica submucosal at age (25E) of pregnancy. The mucosal layer appears for the first time at the age of (0P) day Childbirth Muscle fibers are characterized by the presence of Auerbach's strands intertwined with each other in the tunica external. The lactation stage (7P) after birth represents the emergence of lymphoid tissue in swollen vesicles in the form of domes with the emergence of circular folds within the tunica mucosa and submucosal tunica and the absence of Bayer smear during this stage with the continuation of the histological changes and the appearance of Bayer smear in this part of the small intestine in advanced stages Of old. This study represents great medical importance in the study of digestive disorders related to this part and how to maintain the health of microbes on the one hand and study the formation of lymph tissue after birth and stimulate it by external antigens on the microorganisms and thus induce an immune response by specialized lymphoid tissues associated with the intestine known as the Bayer plaque. Payers patches or (PPs) on the other hand.

Keywprds: Hiistological Development, Ileum In New Zealand
Correspondence:

Nedhal Ibrahim Lateef

department of biology College of education for woman University Of Anbar/Iraq

*Corresponding author: Nedhal Ibrahim Lateef email-address:

edw.nedhal_79@uoanbar.edu.iq

INTRODUCTION

Rabbits and some rodents, such as the guinea pig, were classified as fermenters of the digested nutrients in the hindgut, depending on the microbes present in it. In the jejunum, it contains the intestinal glands (Brunner's glands) in the intestinal glands and goblet cells. Among the intestinal cells in the villi. The ileum is characterized by being the site of adhesion of enzyme molecules and absorption of digestive products, vitamin B12 and bile salts, ⁽¹⁾ It contains large concentrations of lymphocytes within single vesicles known as Peyer patches in the lamina propria of the submucosal matrix, forming a Bayer stain with cells Lymphocytes are the so-called Gut-Associated Lymphoid Tissue (GALT), which acts as an immune barrier in the gastrointestinal tract. Bayer's stain is covered by epithelial cells known as M cells. Stimulation and production of anti-body antibodies especially against antigens ⁽²⁾ The last part of the ileum shows hypertrophy. A muscular globular shape known as Sacculus Rotundus, it is located at the dorsal side of the large intestine to the left of the posterior ventral quadrant. This structure forms the intersection between the ileum, the colum and the cecum. This structure is present only in the order of the cleft. Its immunological function works on blocking the foreign body from entering the small intestine in the rabbit. The part separating the ileum, the circular glomerulus, and the colic is known as the Ileo colic valve. This valve acts on the movement of digested material from the ileum to the organ and prevents it from backward flowing into the ileum again ⁽³⁾

MATERIALS AND WORKING METHODS

Samples

The embryos were obtained during pregnancy, newborn rabbits and New Zealand white baby rabbits from the College of Biotechnology / Al-Nahrain University - Baghdad. The rabbits were mated and separated in special cages to obtain samples before birth, where the mating day was considered day 0 and the birth day was considered day 0P after birth. The rabbits were housed in cages with the provision of artificial lighting conditions (dark / light8-16) and the adoption of a feeding system. On concentrated feed, with continuous access to water, temperature 20-25 ° C and humidity (55-60%), in order to obtain special estrus cycles in female rabbits. ⁽³⁾ Pregnant rabbits were sacrificed using chloroform drops during pregnancy age (25E) and age (0P) on the day of birth, where the embryos were removed and preserved in 10% formalin. The embryos were dissected and the digestive system extracted after the abdominal wall incision and kept in the same fixator, after Initial preservation period The small intestine is dissected and samples are taken from the ileum. After birth, samples are taken from animals of age (7P), the animals are slaughtered, samples are obtained from the ileum in the small intestine and stored in the same fixer These procedures are in accordance with the National Institutes for the Care and Use of Laboratory Animals 1996.

Preparation of histological sections and dyeing:

After dissecting the rabbits and taking the required samples, the organs are washed with neutral physiological solution and then placed in neutral formalin

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at a concentration of 10% for a period of not less than 24 hours. The samples are washed with tap water for half an hour to get rid of the excess stabilizing solution and then an ascending series of ethyl alcohol from 70-100% after They are leached with xylene, after which the samples are impregnated and preserved in molten paraffin wax, then they are buried in special wax molds to be cut into thin strips with a thickness of 3-7 μm . The sections are placed on glass slides swabbed with albumin and glycerin, then they are dried and dyed with hematoxylin-eosin dye and then examined using a light microscope. Compound ⁽⁴⁾.

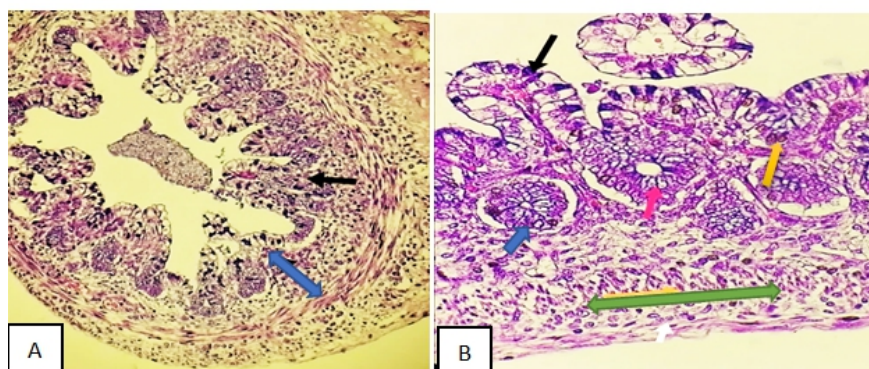
RESULTS

The villi appear shorter and thinner than in the duodenum and the jejunum in a rabbit embryo of age (25E) on the day of pregnancy, covered by simple columnar epithelial cells made up of goblet cells that appear blue in color because they contain acid mucin that diffuses between absorptive intestinal cells and mitotic cells. Intestinal glands Characteristically in Lieberghou's crypts, where a group of undifferentiated cells or stem cells are lined up, leading to differentiation of intestinal cells at later ages, the beginnings of the formation of the intestinal muscle plexus (Auerbach plexus) between the circular and longitudinal smooth muscle fibers can be observed in the outer muscle fibers during this stage. The plicae circulars of the ileum wall appear as folds of tunica mucosa and submucosa. Microscopic examination of the fetus of a Omar rabbit (P0) on the day of birth revealed the morphological maturation of the mucous tunica, where the villi appear longer and covered with a layer of columnar epithelial cells consisting of a central core composed of lamina cells and muscle fibers. The absorptive cells permeate a large number of capsular cells. As a separating boundary between the tunica mucosa and submucosa, Auerbach's plexuses (myenteric plexuses) appear between the muscle bundles, where some of them were detected within the inner thick circular smooth muscles when using the H&E stain. They appear spherical, oval, or elongated in shape of different sizes. Dyed a prominent dark blue. The histological image in the ileum shows age (7 P) after birth - lactation is similar to that observed in the duodenum and jejunum, but the villi were found thinner and less elevated than those parts, the intestinal glands (Brunner's glands)

become in the submucosal tunica, with the division of intestinal crypts distinctly observed during these Stage, the intestinal plexuses spread between the internal muscle fibers, the lymphatic tissue diffuses between the lymphatic vesicles. Some of these vesicles have swollen into the lumen of the coil and become a dome-shaped dome covered by the epithelium associated with the vesicles that appeared near the epithelium of the villi. Bayer's smear did not develop within the mucinous tunica epithelium, circular folds due to increased absorption are observed during this stage.

DISCUSSION

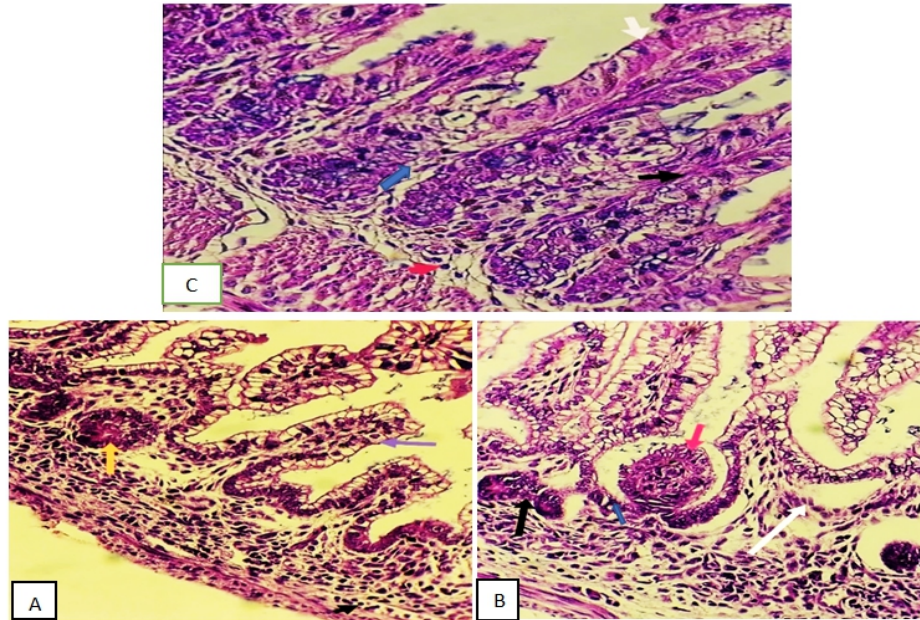
The villi appear in their short primitive form covered with a single layer of simple epithelial cells. This result is consistent with their findings ⁽⁵⁾ Microscopy of a cross-section in the ileum wall of a fetus of age (25E) of pregnancy reveals the appearance of circular folds, which are transverse folds. From the tunica mucosa and submucosal tunica, which is a distinctive feature of which the large intestine is devoid ⁽⁶⁾ Goblet cells spread between absorptive columnar cells and mitotic cells produce myosin of the acidic type, which represents one of the protective mechanisms that mucin perform against microbes. This type has been observed. In animals such as the mouse at birth and the newborn pig ⁽⁷⁾ The intestinal glands appear as spherical or oval shapes near the bases of the villi. Undifferentiated intestinal cells increase in depth and number with advancing age ⁽⁸⁾ The mucosal muscle layer is first observed in a rabbit fetus (P0) on the day of birth and therefore histologically similar to The jejunum ^(9,10) During this stage, a layer of characteristic intestinal plexuses appears between the smooth muscle layers of the tunica extramuscularis, and this result is comparable to that reached by ^(11,12,13) They observed the presence of this plexus along the ileum wall in the small intestine of the newborn animals. Bayer's stain was absent in the ileum in the ileum of a 7P rabbit after birth during lactation while distinct clusters of lymphocytes appear within lymphoid vesicles in the lamina lamina. Some of these vesicles swell to form Dome-like structure This result is inconsistent with the findings of ^(14,15,16) As such a composition appeared in domestic rabbits of (15 P) age before weaning when they started feeding on green fodder in addition to breast milk



Microscopic images showing the development of the ileum wall in the small intestine at stage (25E) on the day of pregnancy. (A): a cross section showing the formation of circular folds (black arrow) in the tunica mucosal and submucosa at 25 days of pregnancy (blue double-headed arrow) B): Longitudinal section. Short, 25-day-old villi notes consisting of acidic blue-colored cystic cells (black

arrow) and mitotic cells (yellow arrow), intestinal glands appearing in the tunica submucosa (red arrow) containing undifferentiated cells (blue arrow) , Internal smooth muscle fibers (green arrow) interspersed with muscle plexuses between the smooth fibers (white arrow) in the tunica outer muscle: hematoxylin eosin stain: magnification power of 400x.

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Microscopic images showing the development of the ileum wall of the small intestine consisting of longitudinal sections in a rabbit aged P7 day after birth - breastfeeding. (A): Long villi (light gray arrow) made of absorptive intestinal cells (blue arrow) appear, intestinal glands within the mucosa are observed (Yellow arrow), submucosal tunica (black double-headed arrow). (B): lymphatic vesicle in the shape of the dome structure (red arrow) separating the structure of the dome with an intestinal epithelium (blue arrow). Note that the intestinal crypts are divided into two (black arrow), circular folds (White arrow) in tunica and submucosa. Hematoxylin-eosin stain: 400x

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