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Histological Study the Renal Corpuscle Distribution in Kidney of Sheep (Ovies Aries) in Middle Iraq

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ABSTRACT: The kidneys in animals are the main excretory structures of the body have a chief character in the keep of fluid and electrolyte equilibrium, control of the blood pressure. The aim of this study to determine the histological structure of renal corpuscles distribution of sheep. Twelve kidney of sheep male and female was collected from massacre middle of Iraq, tissue samples were processed, sectioned and subjected to specific stains to reveal histological details, this study reveal the kidney enclosed by thick capsule consist of dense connective tissue ,the kidneys consist of cortex and medulla, the cortex form the majority of the kidney and it made of large and small renal corpuscle, The renal corpuscles distribution in sub-capsular, mid-cortical and juxta-medullary zone. Renal corpuscle in the subscapular zone less numerically than in other zones, it increasing distribution toward the mid-cortical zone and the Juxta-medullary zone. The diameter of renal corpuscle in sub-capsular zone was less than in mid-cortical renal corpuscle and the juxta-medullary.

Key word: histological, renal corpuscles, sheep.

1. INTRODUCTION

In vertebrates, the kidneys play a prominent role in the regulation of body fluid [1],[2],[3]. Additionally, the kidneys are involved in many physiological processes such as the production of red blood cells, calcium metabolism, and blood pressure regulation [4], [5]. The functional and structural unit of the kidney is the nephron, which is generally composed of the renal corpuscle, proximal and distal tubules, Henle's loop, and collecting tubule and duct [6]. The nephron is basic part of kidney & greatly different in structure with varies vertebrates, the formation of nephrons appears a variable degree in different species. In fowl the kidney has two types of nephrons; reptilian kind small size, & mammalian type large in size loops [7]. Aim of study to detecting the distribution and diameter of renal corpuscles in sheep of middle Iraq.

2. METHODLOGY

2.1 Histological study

In this study used 12 kidneys (6 right kidney and 6 left kidney) from adult ovies aries, was obtained immediately after the slaughter of animals in the massacre from middle of Iraq; the kidneys were rapidly rinsed and preserve 10% formalin solution for 48hrs for the histological preparation, the histological sections stained routinely with Hematoxylin & Eosin stain [8]. The histological sections were documented by light microscope with a using a digital camera 18.0 mega pixels.

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2.2 Results and discussion

The kidneys of the sheep were surrounded by a thick fibrous capsule, which consisted of two layers: inner and outer layer. outer layer contained a great amount of collagen fibers and some smooth muscles through it, the second layer is composed of reticular fibers arranged parallel to the colloidal fibers, and these fibers extend in to the cortex of the kidney (Fig1,2) these fibers protect the kidneys from trauma and give some solidity to kidneys, this result corresponding with [9] in Marwari sheep, and [10] in large whit Yorkshire pig. [11] in the yak and [12] in panther. The renal corpuscles of the sheep kidney were pear shaped (Fig3,4). The diameter measurement of renal corpuscle in sub-capsular zone was 106.58±1.672µm, in mid-cortical renal corpuscle was 151.39±2.834µm and the juxta-medullary was 143.85±2.722µm, respectively (Table1).The distribution of renal corpuscle in the sub capsular zone was 28.5±1.035 µm ,in the mid cortical zone was 43.8±0.818 µm and in juxta-medullary was 31.5±0.433 µm. the number of renal corpuscles in sub capsular region few in this region while more notice when continued toward the mid-cortical and juxta-medullary zone due to the sheep kidneys contain large amount of long loop henle and few short loops of henle in mid cortical and juxta medullary area which act to concretion of urine in cattle. The renal corpuscular density distribution was found to be significantly ($p \leq 0.05$) higher in the mid-cortical region than that in the sub capsular and juxta-medullary region (Fig1,2,3). this result not corresponding with [13] which reported in dog due to different species between sheep and dog and type of nutrition. Glomerulus capsule consist of visceral layer made from podocytes enclose a glomerular capillary tuft & parietal layer consist from the simple squamous epithelium tissue this finding corresponding with [14],[15] were reported in Marwari sheep. A filtration barrier presented in the middle two layers of urinary cavity made from: capillary tuft, endothelial, basement membrane & slit diaphragm between podocytes cells, the proximal convoluted tubules lined by simple columnar epithelial layer with brush margin the nucleus spherical with wide lumen while the distal convoluted tubules smaller the proximal don't contain brush margin, with large lumen (Fig4). this result similar with [16],[17] in Panther.

Table1.-Explian renal corpuscular distribution and renal corpuscle diameter measurement

Renal corpuscle	Distribution Percentage (Mean±SE)	Diameter (Mean±SE)
Sub-capsular region	28.5±1.035 b	106.58±1.672 b
Mid-cortical region	43.8±0.818 a	151.39±2.834 a
Juxta-glomerular region	31.5±0.433 c	143.85±2.722 c

The similar letters represent no significant differences between three regions at $P<0.05$
The different letters represent significant differences between three regions.

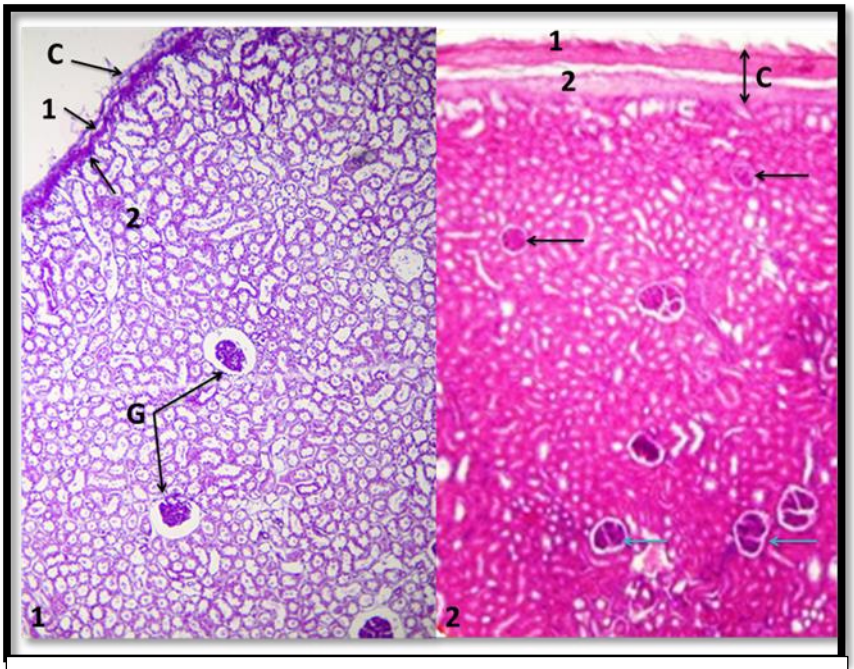

FIGURE1. show the cortex area of kidney in sheep; capsule of kidney (C), outer layer of capsule (1), inner layer of capsule (2), sub capsular renal corpuscle (G), H&E stain,10X.

FIGURE2.-sub capsular renal corpuscle black arrow, mid cortical

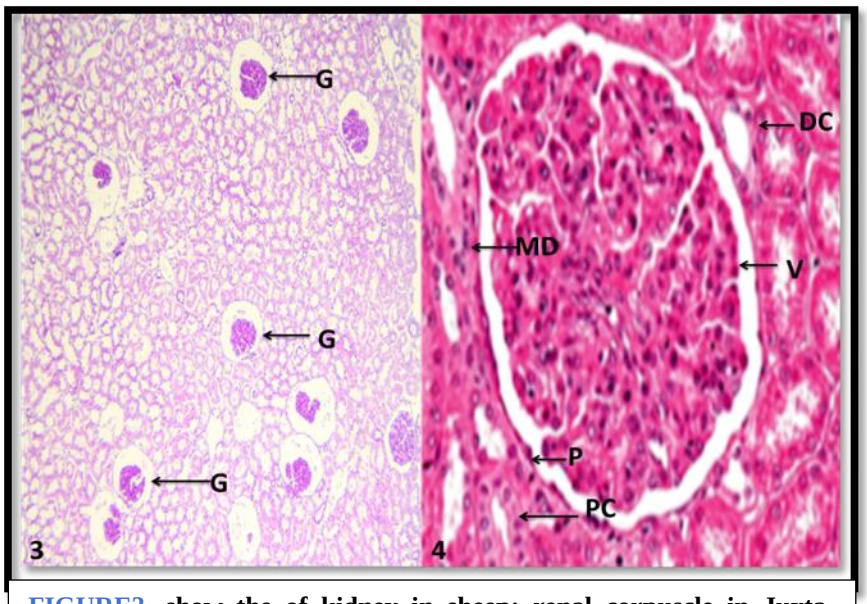

FIGURE3. show the of kidney in sheep; renal corpuscle in Juxta-glomerular region (G), H&E stain,10X.

FIGURE4. show the structure of renal corpuscle of kidney in sheep; Distal convoluted tubule (DC), Proximal convoluted tubule(PC),Visceral layer(V),Parietal layer(P),Macula Densa

3. CONCLUSION

The renal corpuscles distribution in sub-capsular, mid-cortical and juxta-medullary zone, Renal corpuscle in the subscapular zone less numerically than in other zones, it increasing distribution toward the mid-cortical zone and the Juxta-medullary zone.

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