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HOUSE IN RAY

Asghar Ahmadizad yekta

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INVESTIGATING THE FREQUENCY OF MACROSCOPIC AND MICROSCOPIC LESIONS OF BOVINE KIDNEY IN SLAUGHTER HOUSE IN RAY

Asghar Ahmadizad yekta

Islamic Azad University of Garmsar, Faculty of Veterinary Medicine
(IRAN)

asghar.ahmadizad@gmail.com

ABSTRACT

Despite Widespread studies in other countries, comprehensive studies haven't been done in Iran. Urinary tract deceases are common and important. This study was designed in order to conduct a comprehensive histopathologic study about kidney lesions in domestic animals, especially in ruminants. The main aim of this article is the determination of the macroscopic and microscopic lesions in the kidney of cows of varamin. The obtained results of study indicates that changes in tube-interstitial (98%) are the most common. Glomeric changes (90%) and arterial changes (40%) are placed in other orders. Histologic evidence of glomerulonephritis in 90% of cases was observed that the majority were Membrane-additive glomerulonephritis type. Based on the lesion spread the majorities of cases were interstitial nephritis of multi focal type and based on the time most of cases under the study were acute interstitial nephritis.

Keywords: kidney lesions, slaughtered cows in pourya – ya Vali, Histopathologic.

1. INTRODUCTION

Urinary tract is one of the most important body systems and has an important role in Homeostasis. Kidneys are considered the most important part of this system and most of disorders of the urinary tract, at least in domestic animals, are related to the kidneys. Kidneys may have different lesions. The diseases of this organs not also adverse effects on the urine tract but also have adverse effect on entire body. Kidney like liver has a high activity that leads to more damage of these organs. As long as the majority part of kidney tissue is not inactive, clinical disorder will attract less attention of Veterinarians. When we referred to the slaughtered cows' high prevalence of histopathological lesions is observed which is less consistent with the clinical aspects. Therefore, in order to have a more accurate estimate of kidney lesions it would be better that through slater house studies investigate these lesions. As regards all components are closely interconnected, involvement of one of these components causes the involvement of other components. As a result, this makes the kidney lesions to be progressive. When we study them in the slaughterhouse studies, indicate the more or less similar histological view. Whereas exact type of lesions in terms of general and specific pathological changes has been done less detailed at least in our country, we decided to design a pathological lesions study of all cows in one of the slaughterhouse around Tehran to obtain relative estimation of lesion Frequency. Clearly with next comprehensive studies in different parts of country would estimate relative frequency percentage of various typed of kidney lesions more accurately. However, through identifying the type of lesions the cytopathologic aspect of lesions are identified to be considered that with the design of research projects recognizing the relationship between lesions and etiologic factors thereby we can better control the urinary tract diseases, especially kidney lesions and prevent the economic losses due to such disuses. It is hoped that this study can be used by scholars.

2. MATERIALS AND METHODS

To conduct these study thousand kidneys was related to referred cows of pourya-ye vali slaughterhouse located around Tehran were investigated at the beginning of spring. First appearance of kidney in terms of color, texture, distribution of lesions in different part of kidney, the existence of nodules and parasitic lesions examined. Hundred kidneys from the thousand examined kidneys had evidence and macroscopic lesions of kidney diseases were selected.

- I. After removing the capsule of kidney, the surface of kidney in term of macroscopic lesions was assessed then a sagittal section was given to kidney and kidney cross section for the presence of the lesions was assessed.
- II. Then for sampling, Wedge-shaped sample was prepared that base of the wedge into the capsule and its head was toward the medulla.
- III. For better fixing of samples, the samples were not more than 5 mm. The samples were prepared as lesions area including healthy area. Each sample was immersed in container containing formaldehyde ten percent and formalin volume of each sample was ten times more than volume of sample. Containers of samples were coded. After

24 hours the formalin solution of each sample was replaced. Samples at least for a week placed in ten percent formalin solution to fix them very well.

Then samples were transferred to the pathology laboratory and fixed samples were cut in standard size. Cut samples for modeling with paraffin passed different various stages of preparation, and then paraffin templates were made. Paraffin templates sections with thickness of 5.6 mm produced by rotary microtome. Sections after passing usual stages through common method of hematoxylin and eosin were stained. For the presence of lesions were examined accurately by light microscope. Microscopic sections with low magnification (3/2) moderate Magnification (1) and high magnification were examined for pathological Microscopic images were taken from the lesions and finally occurrence of various types of kidney lesions was determined. Obtained result presented in tables and diagrams.

3. RESULTS

After collecting samples and preparing microscopic sections, kidney lesions based on involvement of various components of kidney like renal corpuscle, tubes, interstitial area and Kidney arteries were assessed. Images 1 to 12 and diagrams 1 to 8 represent obtained result in this study. It is worth noting that in this study some kidney lesions like kidney infarction, Acute tubular necrosis, kidney medulla necrosis, hydro-nephrosis, amyloidosis, renal tumors, kidney birth defects, kidney stones, pigment changes in tubes and other sundry lesions was not observed.

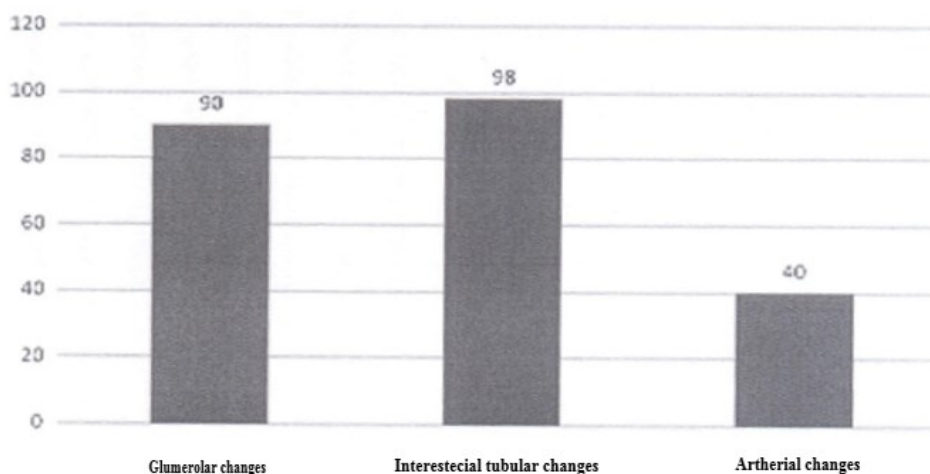


Diagram1. Column chart of the frequency of kidney lesions

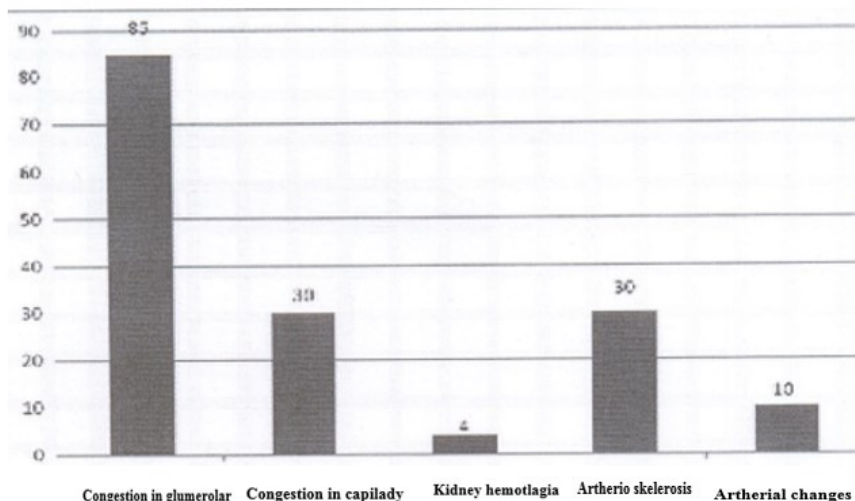


Diagram2: column chart of frequency of vascular lesions

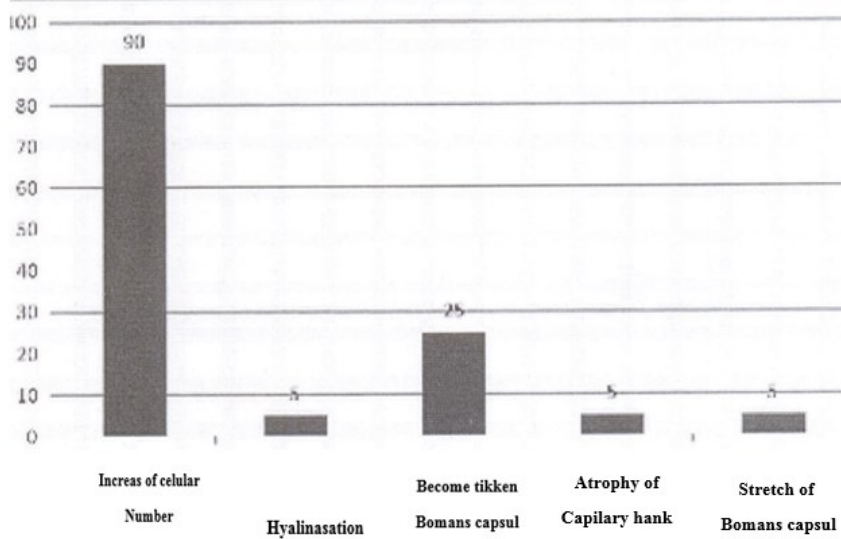


Diagram3: Diagram column frequency of various glomerulonephritis histological changes

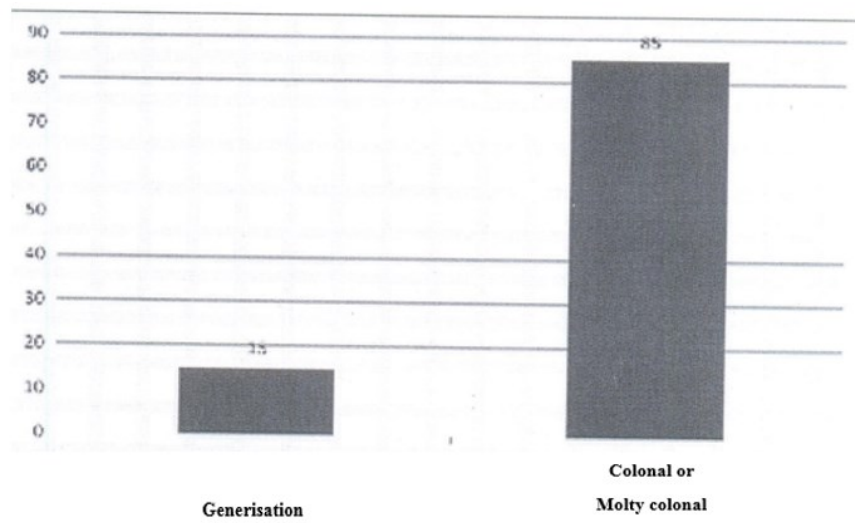


Diagram 4: diagram column classification of interstitial nephritis based on prevalence of lesion

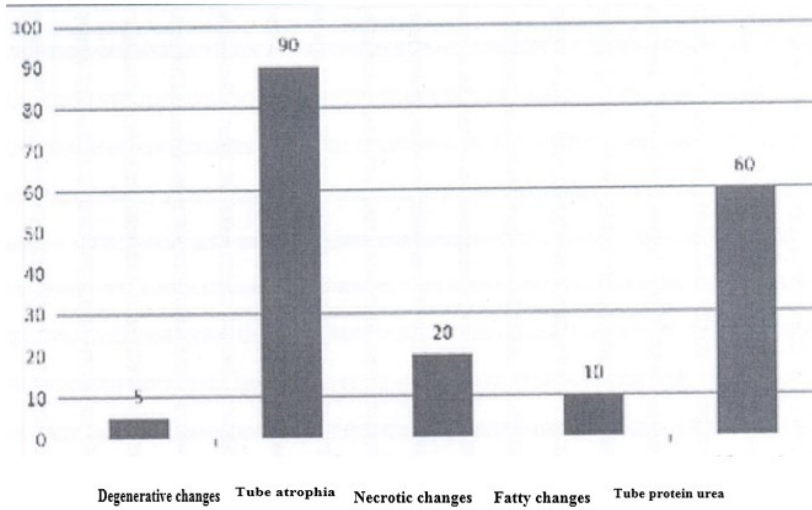


Diagram 5: column chart of frequency of different tube lesion

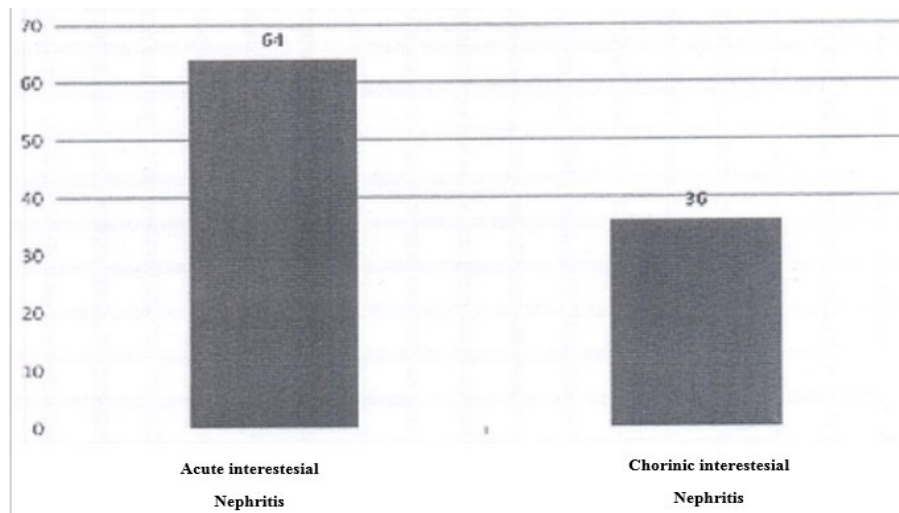


Diagram 6: column charts, classification of frequency of various tubular- interstitial lesions based on time.

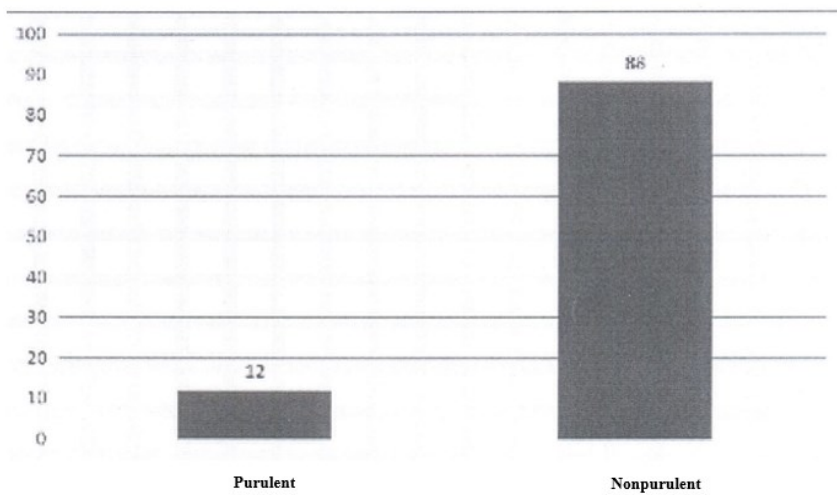


Diagram 7: column chart of classifying type of tubular-interstitial nephritis based on exudate type.

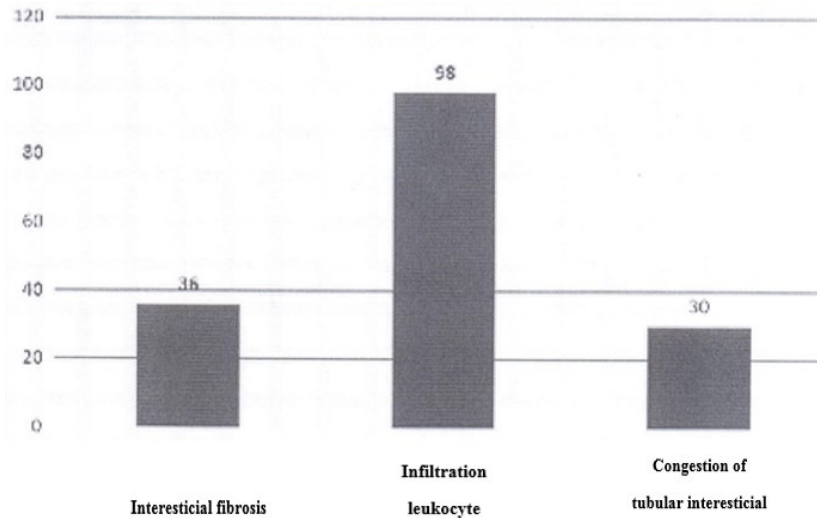


Diagram 8: column chart of the frequency of general interstitial lesions.

4. DISCUSSION AND CONCLUSION

In this study macroscopic and microscopic lesions of all cows in a slaughterhouse around Tehran were examined. Information on the kidney lesions in cows is very sparse in Iran and the study hasn't been done all over the country. The necessity to carry out such studies is obtaining the information to prevent the distribution of renal in different parts of Iran. The main objective of this study is to investigate the frequency of renal lesions in cows.

The obtained result in this study is more or less concordance with similar studies. In the study of kidney lesions the most commonly observed changes were tube- interstitial changes that mainly its histological evidence was a reflection of kidney white spots. A regards this lesion and interstitial nephritis are common in the general lesions. These results are consistent with other studies. Since the samples are selected based on visual observations and these types of changes can be assessed by the naked eye. Probably in selection of lesions. These types of samples were sampling more. Also considering that sampling intervals are short and each other, the diversity of lesions is reduced. Glomerular changes after intermediate tubes are in the second rank. Other sources also acknowledge the prevalence of glomerular changes in ruminants. These changes are not consistent with clinical findings and many of ruminants that indicate histological evidence of glomerular changes have no problem in term of clinical aspect. The interesting point in this study is the frequency changes of arteries. In 40% of samples under the study arterial changes were observed, while other sources considered this changes rare at least in ruminants, it should be noted that changes in the arterial vascular disease as early vascular disease as early vascular Disease of ruminants is rare. But considering that vast majority of the samples had fibrosis. Minimum vessel wall thickening was seen in 30% of samples that would be secondary changes of extensive fibrosis. Also lack of adequate sampling intervals can be helped to collect similar lesions. Another point of interest is arterial inflammation that was observed in 10% of samples. Lesion which reminds the malignant catarrhal fever. According to the presence of simultaneous lesion in the kidney, which may be indicative of the disease, the herd that slaughtered was likely to have the disease. Other sources also support this point of view.

Among the types of vascular lesions, hyperemia the most common change that due to the occurrence of inflammatory processes is an expected change. Hyperemia in glomerular capillaries and capillary tubes were observed. Changes in the walls of arteries discussed previously. In investigating the glomerolic changes histologic glomerulonephritis evidence is seen. Although further more comprehensive and complementary studies are needed to identify to identify the exact type of glomerulonephritis but Histopathologic evidence represents frequency occurrence of glomerulonephritis of Mesangioproliferative glomerulonephritis. Glomeruli with general changes such as increasing the number of cells, thickening of Bowman's capsule, hank capillary atrophy and dilation of Bowman's capsule are shown. It was being observed in a small percentage of hyaline glomeruli. These findings and the obtained results are quit consistent with the findings of other studies.

Interstitial nephritis is classified based on the propagation of lesion and based on majority of focal or multifocal lesions. Since interstitial nephritis in large ruminants' mainly multifocal kind, results are consistent with other studies. (4) General pathological changes in tubes are mainly in the form of a generalized atrophy of the tubules, although other changes such as degenerative changes and necrosis and particularly tubular proteinuria And hypertrophy of remain tubules is also observed. Considering that high percentage of samples indicates the interstitial- tubular nephrite, observing tubular atrophy is expected. Tubular proteinuria indicates the increase of

penetration in glomerulus and as the result glomerular changes which has been seen in many samples. Hypertrophy of renal tubules is usually one of the signs of kidneys at the last stage that is observed in many samples. Tubular specific disease such as acute tubular necrosis (Nephrosis) and also pigment changes and other lesions weren't observed in tubules that would be due to the rarity of these lesions, as well as lack of adequate intervals in the sampling and is also a small number of samples. Certainly investigating with more samples and longer intervals may be rare in dealing with lesions.

Tubular- Interstitial lesions are mainly acute based on time and based on exudate were none pucker and general lesions observed in this case were including Leukocyte infiltration in the interstitial space, interstitial fibrosis and capillary congestion around the tube that all lesions are known as tubular-interstitial nephritis. It was observed that changes are consistent with the findings of other studies.

It is worth noting that aforementioned frequency percentage is indicated in samples 1-4 to 4-8.

Considering the limitation of this thesis particularly the time limitation, it is recommended to determine a more accurate frequency percentage of kidney lesions in cows a more extensive study over one year (all seasons) is done and the influences of factors such as age and sex of the animal is considered.

Also through applying supplementary tests (microbiological analysis, etc.) may also be provided etiologic diagnosis of diseases and therefore a more detailed statistics of common diseases in cows of this area and other parts of Iran are being provided.

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Figures:

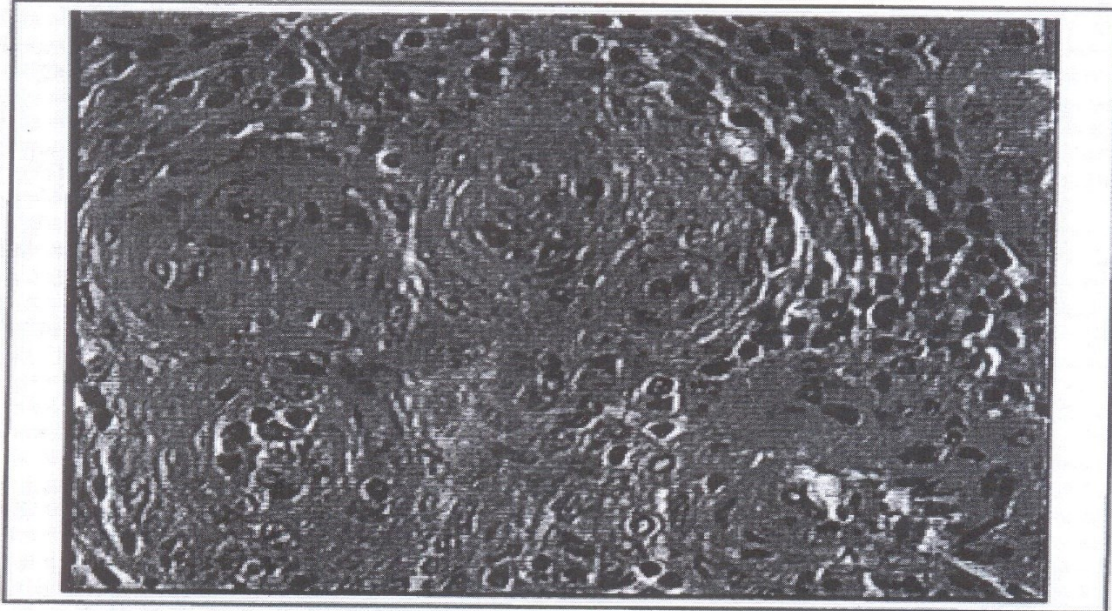


Figure 1. Arteries inflammation in the kidneys with high magnification, Notice the Hyaline wall of the vessel and crushed remnants of nuclear leucocytes in the artery walls

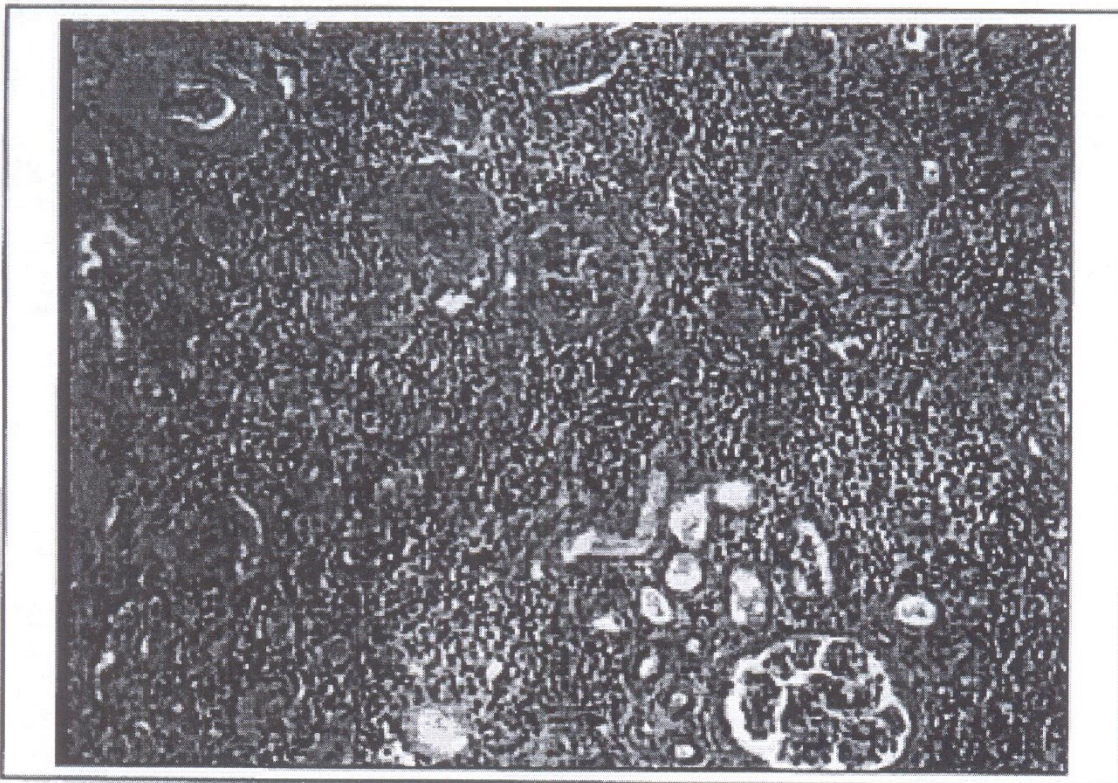


Figure 2. chronic interstitial nephritis in the kidneys with moderate magnification, sclerosing hyaline glomeruli of the expansion of tubules and generalized atrophy of tubules hypertrophy and dilatation of the remaining tubules, interstitial infiltration observed in space of mononuclear cells.

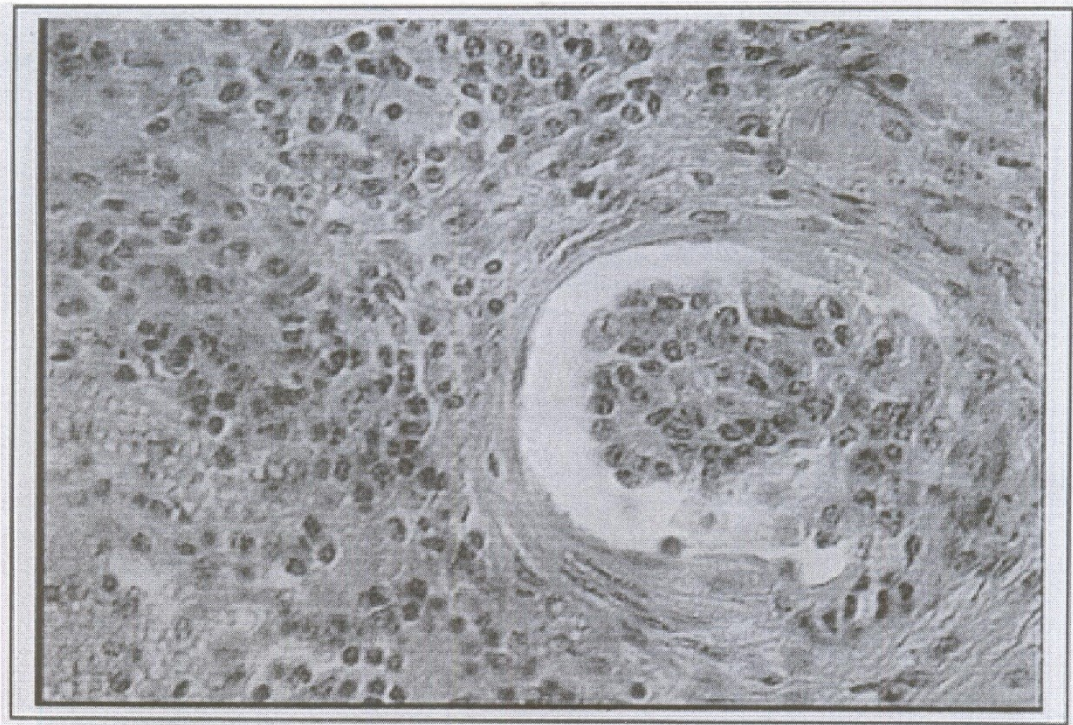


Figure 3. chronic interstitial nephritis in the kidneys with high magnification, in the lower right corner of the image, An image of a cystic glomerol seems, and fibrosis around glomerular is seen and indicate that in the left view of picture infiltration of mononuclear and generalized tubular atrophy along hyperemia is seen.



Figure4. Chronic interstitial nephritis, the view of kidney at the last stage with moderate magnification, notice the vast interstitial fibrosis and generalized tubular atrophy and infiltration of mononuclear cells hypertrophy and dilatation of the left tube.

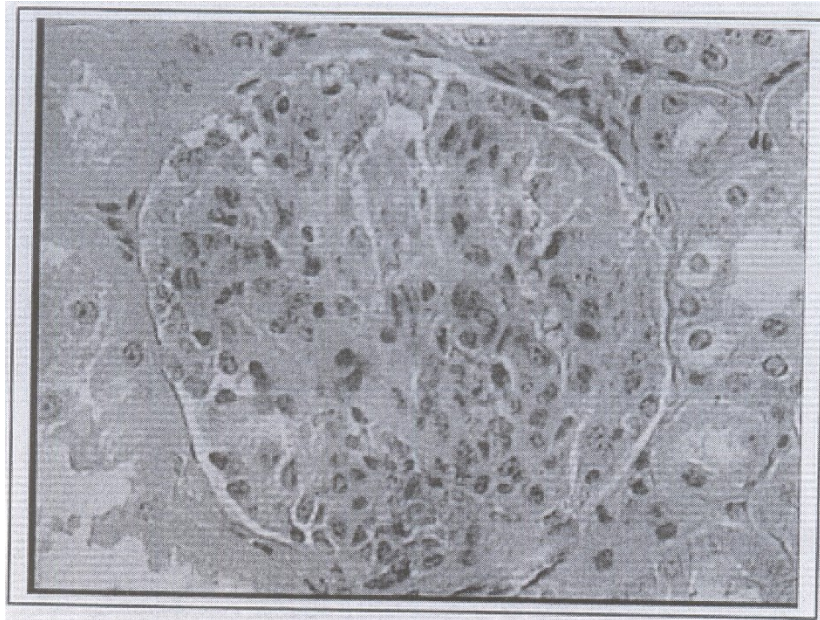


Figure5. glomerularic Histological changes: High magnification with increased cellularity with hyperemia and disappearance of the ion space is observed. Endothelial and Mesangial cells are increased.

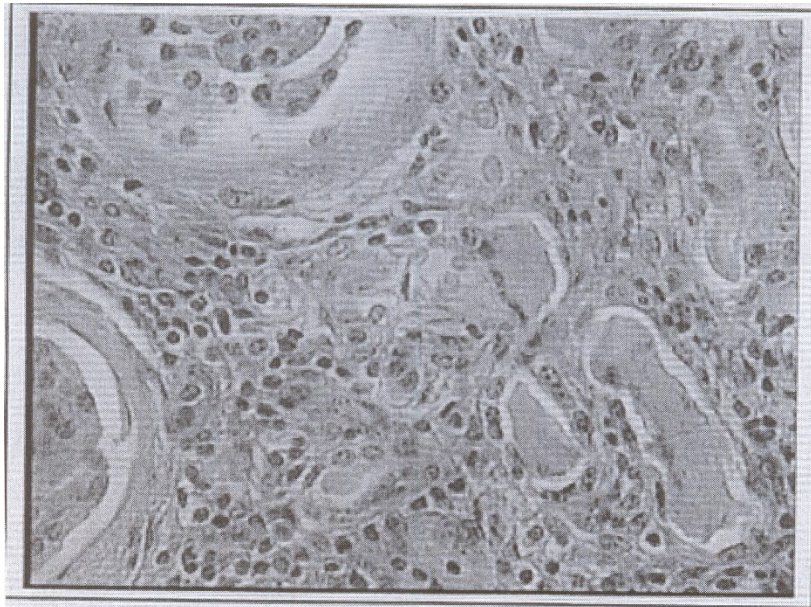


Figure6. Chronic interstitial nephritis in kidney with high magnification, notice the hyaline cyst in the lower left corner, mononuclear cell infiltration, interstitial fibrosis, glomerular around the left side, bottom and top of the image can be seen.

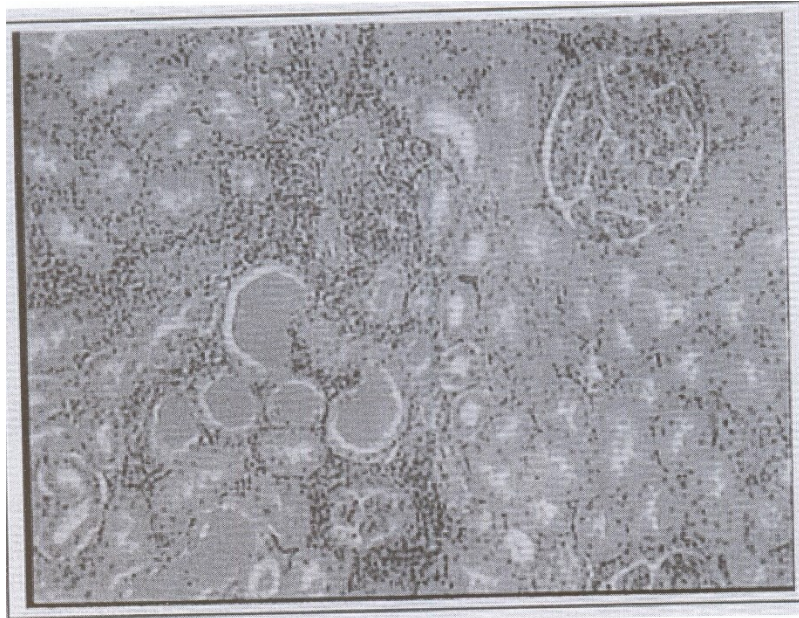


Figure7. Acute interstitial nephritis in the kidneys with moderate magnification, notice the hyaline cyst, Leukocyte infiltration in the interstitial spaces surrounding the glomerulus.

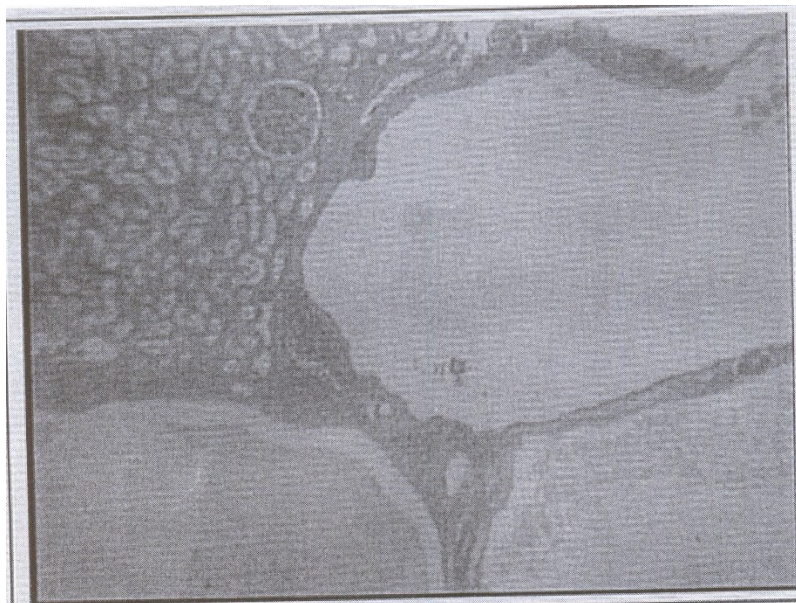


Figure8. Kidney cysts with low magnification, a part of the walls of some cyst are seen with low magnification.

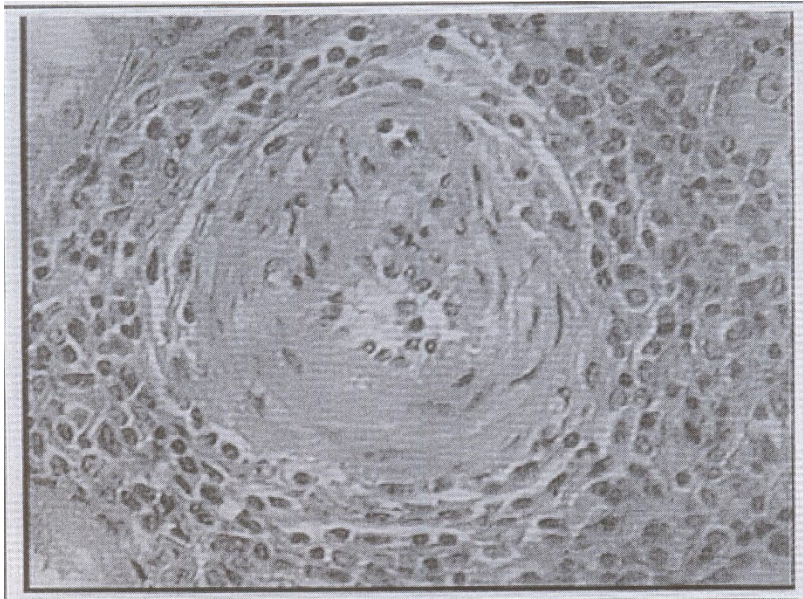


Figure 9. Arteriosclerosis with high magnification, Arteriosclerosis changes in the wall of blood vessel, lumen diameter reduction, accumulation of leukocytes (mononuclear cells around blood vessels)

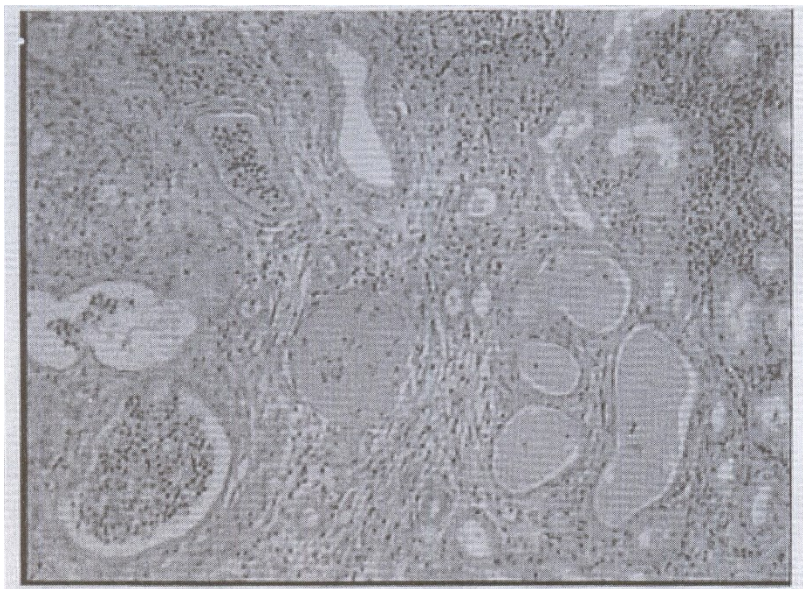


Figure 10. Chronic interstitial nephritis with medium magnification, observing the grainy hyaline cysts extensive fibrosis and Leukocyte infiltration of multi-core can be seen in the interstitial region.

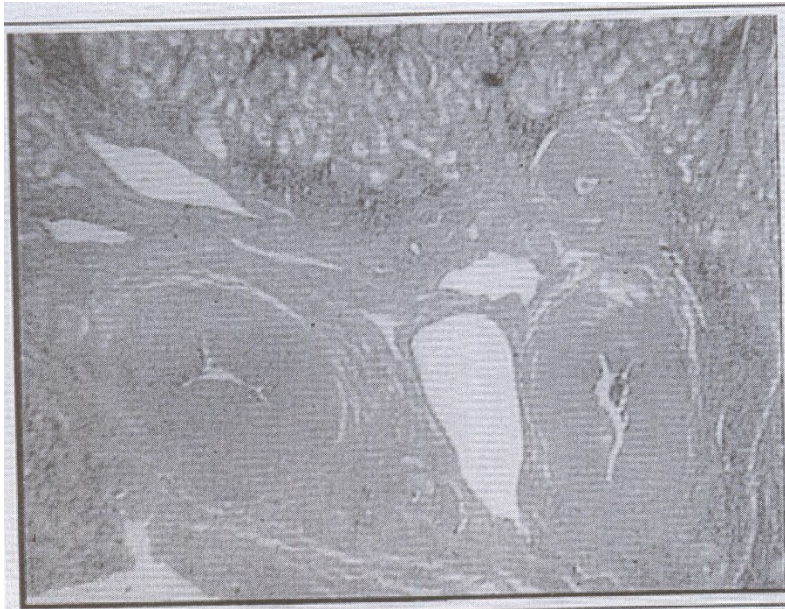


Figure. 11 Acute multifocal interstitial nephritis none wrinkled with medium magnification, arteriosclerosis and leukocyte infiltration seen around the arteries and interstitial areas.



Figure 12. Chronic kidney interstitial nephritis (last view of kidney) with medium magnification, extensive interstitial fibrosis, tubular atrophy, reduction of glomerular hypertrophy and dilatation of the left tube and mononuclear cell infiltration is seen.