Intercapillary Glomerulosclerosis in Puerto Rico[1]

A Report of Six Cases, One with Autopsy Findings

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In 1936 Kimmelstiel and Wilson[2] described a new pathological entity characterized clinically by hypertension, edema, diabetes mellitus, albuminuria, retinal vascular changes, and some degree of renal insufficiency. Pathologically, a striking hyaline thickening of the intercapillary connective tissue of the glomeruli was the most salient finding. The same authors[3] concluded that "only a small proportion of diabetics appear to show this lesion." Siegal and Allen,[4] however, encountered the lesion in thirty-five, or one third, of 105 diabetics. It was likewise present in twelve of sixty diabetics without hypertension or renal complications, and in fourteen of eighteen diabetics with clinical evidence of renal damage. They emphasized the value of the lesion as a useful histologic criterion in the post-mortem diagnosis of diabetes mellitus. In 1938 Anson[5] studied the histologic picture of the kidneys in 900 consecutive post-mortems, and found changes typical of "intercapillary glomerulosclerosis" in only six instances. Derow, Altschule, and Schlesinger[6] and Newburger and Peters[7] have analyzed the clinical picture of the disease. These authors support the thesis presented by Kimmelstiel and Wilson[8] that the condition is almost always associated with hypertension, diabetes, and albuminuria, and often with a nephrotic syndrome.

We are presenting six clinical cases which we believe show all the characteristics of the syndrome; one of these came to autopsy, and the findings were fully confirmatory.

1. Received for publication September 26, 1941.

2. P. Kimmelstiel and C. Wilson, "Intercapillary Lesions in Glomerruli of Kidney," *Am.J. Path.*, XII (1936), 83–98.

3. *Ibid.*

4. S. Siegal and A. C. Allen, "Intercapillary Glomerulosclerosis (Kimmelstiel-Wilson) and the Nephrotic Syndrome," *Am.J.Med.Sc.*, CCI (April, 1941), 516–27.

5. L. J. Anson, "Intercapillary Glomerulosclerosis," *South.M.J.*, XXXI (December, 1938), 1272–75.

6. H. A. Derow, M. D. Altschule, and M. J. Schlesinger, "Syndrome of Diabetes Mellitus, Hypertension and Nephrosis; Clinical and Pathological Study of Cases," *New England J.Med.*, CCXXI (December 28, 1939), 1102–05.

7. R. A. Newburger and J. P. Peters, "Intercapillary Glomerulosclerosis; Syndrome of Diabetes, Hypertension and Albuminuria," *Arch.Int.Med.*, LXIV (December, 1939), 1252–64.

8. P. Kimmelstiel and C. Wilson, *op. cit.*

PRESENTATION OF CASES

CASE 1. *T. V.—A–159:* A married, white Puerto Rican female, fifty-three years of age, admitted to the Out-patient Department of the University Hospital of the School of Tropical Medicine on June 14, 1940, with a history of diabetes mellitus of one year's duration, controlled by diet and by the daily administration of 40 units of protamine zinc insulin. Nine months previous to admission she had been hospitalized elsewhere, where she was found to have osteomyelitis of the left lower jaw and hypertensive cardiovascular disease. The past history was noncontributory except for an attack of typhoid fever in childhood. Her father had pulmonary tuberculosis and her mother suffered from diabetes mellitus.

Physical examination revealed a well-developed and well-nourished, not acutely ill, female, with a blood pressure of 250 mm. of Hg systolic and 120 diastolic. The most outstanding findings were a periosteal thickening at the site of the aforementioned osteomyelitis of the left lower jaw; total edentia; heart enlarged toward the left with a regular rhythm and a normal rate, but with a soft systolic murmur at the mitral and aortic regions; an enlarged nontender liver palpable four and a half fingerbreadths below the right costal margin; moderate peripheral arteriosclerosis; and a grade I pitting edema of the ankles. Examination of the eye fundi by Dr. R. Fernández revealed the presence of two minute hemorrhages deep in the retina on the nasal side of the papilla and mild arteriosclerosis of the retinal vessels of the right eye. The left eye presented an old cataract with adhesions to the internal membrane.

Laboratory findings were as follows:

Hemoglobin—106 percent (15.4 grams) (Hellige-Wintrobe)
Red blood cells—5.57 millions per cmm.
White blood cells—12,300 per cmm.
Neutrophiles—41 percent
Eosinophiles—6 percent
Lymphocytes—53 percent

Urine:

Specific gravity—1.009
Albumin—Traces
Glucose—Negative
Sediment—Few fine granular casts

P. S. P. elimination test 52.66 percent in two hours

Blood Chemistry:

Blood glucose—142.7 mgs. percent
N. P. N.—33.3 mgs. percent
Urea nitrogen—13.7 mg. percent
Serum proteins—6.58 grams percent

Serum albumin—4.35 grams percent
Serum globulin—2.23 grams percent
Kahn Blood Test—000
Feces—*A. lumbricoides* ova (infertile)

Repeated examinations revealed a persistent hypertension, a moderately high fasting blood glucose, and a grade I pitting edema of the ankles.

CASE 2. *A. A. V.—A-7:* A fifty-two-year-old, white, married Puerto Rican male admitted to the University Hospital of the School of Tropical Medicine on March 23, 1940, with a typical history of diabetes mellitus of about a year's duration, hypertensive cardiovacular disease, and a left facial paralysis of thirteen days' duration. He had been receiving treatment for his diabetes with diet and fifteen units of insulin every day before breakfast. The patient suffered from a specific urethritis when he was quite young and had an attack of malaria in 1921, which persisted for nineteen days. On two different occasions he had what appeared to be attacks of catarrhal jaundice. His father died of renal trouble at the age of fifty and his mother of cerebral hemorrhage at sixty.

Physical examination revealed a well-developed, heavy-set, plethoric Puerto Rican male of about the stated age, not acutely ill, with a left facial paralysis and a blood pressure of 190 mm. of Hg. systolic and 120 diastolic. His heart was enlarged toward the left and showed a regular rhythm, a normal rate, and an accentuated second aortic sound. There was moderate peripheral arteriosclerosis. The liver edge was just palpable on deep inspiration. There was increase of the area of splenic dullness and a large hydrocele on the left side. The physical examination was otherwise negative.

The diabetes was controlled by diet exclusively. Repeated blood pressure determinations revealed a persistent hypertension. The patient was discharged April 1, 1940, with instructions to follow the diet prescribed. Marked improvement of his facial paralysis was recorded. On October 8, 1940, he was readmitted for a general check-up and for operation of the left hydrocele. At that time his blood pressure was 180 mm. of Hg. systolic and 120 diastolic. His heart was enlarged to the left, with occasional extrasystoles, a soft systolic murmur at the mitral area, and an accentuated second aortic sound. Left-sided hydrocele and slight ankle and pretibial edema bilaterally were also noted.

Laboratory findings on both admissions were as follows:
Hemoglobin—114 percent (16.4 grams) (Hellige-Wintrobe)
Red blood cells—5.53 millions per cmm.
White blood cells—6,950 per cmm.
Neutrophiles—53 percent
Eosinophiles—9 percent
Lymphocytes—38 percent

Urine:
Specific gravity—1.004
Sugar—Negative
Albumin—Heavy traces
Sediment—Moderate numbers of hyaline casts and four to six red blood cells per high-power field
Kahn Blood Test—000
Stools—Cysts of *E. coli* and *E. nana*

Blood Chemistry:
Glucose—113 mg. percent
N. P. N.—25 mg. percent
Urea N.—12.3 mg. percent
Serum proteins—6.49 grams percent
Serum albumin—4.23 grams percent
Serum globulin—2.26 grams percent
P. S. P. Elimination Test—39.5 percent in two hours

Repeated urinalysis revealed a good concentrating power (without glycosuria), and moderate to heavy traces of albumin as well as hyaline casts in fair numbers.

CASE 3. *R. G. M.—A-59:* A fifty-seven-year-old Puerto Rican widow admitted to the University Hospital on May 18, 1940, for the purpose of study. She had been under observation in the Out-patient Department since 1935, having received treatment for diabetes mellitus during this time. The control of her condition had been quite difficult due to her financial status, which prevented her from following a proper diet or receiving the necessary insulin. She had been affected with attacks of recurrent tropical lymphangitis for many years, resulting in moderate elephantiasis of both legs. The history was otherwise irrelevant.

Physical examination revealed an obese, white Puerto Rican female, not acutely ill, with a blood pressure of 190 mm. of Hg. systolic and 100 diastolic. She presented xanthomatous growths in the left eyelid, complete edentia, bilateral arcus senilis, a heart enlarged to the left, with a regular rhythm and a normal rate, and a prediastolic murmur at the apex and aortic regions, respectively. The peripheral vessels were hardened and tortuous, and her lower extremities presented a moderate degree of elephantiasis.

The laboratory examinations were as follows:
Hemoglobin—99 percent (13.6 grams) (Hellige-Wintrobe)
Red blood cells—4.79 millions per cmm.
White blood cells—6,600 per cmm.
Neutrophiles—71 percent

Eosinophiles—4 percent
Lymphocytes—25 percent
Kahn Blood Test—000
Stools—Whipworm ova

Urine:
Specific gravity—1.028
Albumin—Traces
Glucose—20 grams per 1,000 cc.
Sediment—Negative

Blood Chemistry:
N. P. N.—32 mg. percent
Uric acid—3.1 mg. percent
Glucose—285.7 mg. percent
Cholesterol—147.3 mg. percent
Total proteins—7.41 grams percent
Albumin—4.39 grams percent
Globulin—3.02 grams percent
P. S. P. Elimination Test—69 percent elimination in two hours

With rest in bed and sedatives the blood pressure came down to 130 mm. of Hg. systolic and 60 diastolic. The diabetes was controlled with diet and the administration of protamine zinc insulin.

CASE 4. *F. R.—A-537:* A fifty-seven-year-old, married, white Puerto Rican female admitted to the University Hospital on September 20, 1940, for the purpose of study. She had been coming to our Out-patient Department since August, 1937, at which time she was found to be suffering from diabetes mellitus and elephantiasis of both lower extremities, due to recurrent attacks of tropical lymphangitis. She was treated with diet and insulin, but in spite of this, repeated urinalysis revealed glycosuria and albuminuria, as well as a fairly high blood sugar level.

Physical examination presented a well-developed, obese, white Puerto Rican female, not acutely ill, with a blood pressure of 144 mm. of Hg. systolic and 76 diastolic. There were fresh hemorrhagic areas in both retinae. The heart was moderately enlarged to the left, with a normal rate and a regular rhythm. The liver was palpable 2 cm. below the right costal margin. The lower extremities presented slight elephantiasis.

Laboratory work was as follows:
Hemoglobin—82 percent (11.9 grams) (Hellige-Wintrobe)
Red blood cells—4.33 millions per cmm.
White blood cells—9,050 per cmm.
Neutrophiles—66 percent
Basophiles—1 percent
Lymphocytes—33 percent

Urine:
Specific gravity—1.005
Albumin—Traces
Sugar—Negative
Sediment—Few hyaline casts, three to four R. B. C. per high-power field
Kahn Blood Test—000
Stools—Cysts of *E. hystolitica* and whipworm ova

Blood Chemistry:
N. P. N.—34 mg. percent
Urea N.—15.4 mg. percent
Glucose—142.8 mg. percent
Total Proteins—7.20 grams percent
Serum Albumin—3.70 grams percent
Serum Globulin—3.50 grams percent
Glucose Tolerance Test—Diabetic curve
P. S. P. Elimination Test—46 percent total elimination in two hours

The diabetes was controlled with diet and insulin.

CASE 5. *T. L.—A-25:* A fifty-three-year-old, single, colored Puerto Rican male admitted to the University Hospital on April 29, 1940, for study. He had been followed up in the Out-patient Department since November 16, 1939, when he was found to be suffering from diabetes mellitus of three years' duration, hypertensive cardiovascular disease, and aortitis.

On physical examination he was found to be a well-nourished and well-developed colored male, chronically ill, and with a blood pressure of 220 mm. of Hg. systolic and 140 diastolic. The eye fundi showed multiple recent and old hemorrhages, arteriosclerosis and perivasculitis of the retinal vessels, as well as partial atrophy of both optic nerves. The chest was barrel-shaped, and the heart was enlarged to the left as well as to the right, with a regular rhythm and a normal rate. There was a systolic murmur in the aortic and mitral areas and a ringing second sound at the aortic region. The liver was palpable 1.5 cm. below the right costal margin. There was evidence of marked peripheral arteriosclerosis and a grade I pitting edema of both lower extremities. The testicles presented a billiard ball-like induration.

Laboratory findings were recorded as follows:
Hemoglobin—59 percent (8.6 grams) (Hellige-Wintrobe)
Red blood cells—3.8 millions per cmm.
White blood cells—10,200 per cmm.
Neutrophiles—69 percent
Eosinophiles—5 percent
Lymphocytes—26 percent

Urine:
Specific gravity—1.006
Sugar—Negative
Albumin—Traces
Sediment—Negative
Kahn Blood Test—3–3–3
Feces—Hookworm ova and cysts of *E. coli.*

Blood Chemistry:
N. P. N.—54 mg. percent
Urea N.—18 mg. percent
Cholesterol—163 mg. percent
Total proteins—6.53 grams percent
Serum albumin—4.31 grams percent
Serum globulin—2.22 grams percent
Sugar Tolerance Test—Diabetic curve

P. S. P. Elimination Test—12.5 percent total elimination in two hours

The patient was discharged from the hospital on May 17, 1940, having improved but slightly. Afterward, he developed marked visual impairment and felt miserable. His blood pressure remained persistently high and finally he died at his home. Unfortunately, an autopsy could not be performed.

CASE 6. *E. F. O.—A–302:* A white Puerto Rican widow of sixty years of age, admitted to the University Hospital on July 19, 1940, complaining of soreness of mouth and tongue, burning on defecation, diarrhea, urinary retention, swelling of eyelids and ankles, dyspnea on exertion, and pain in the face. The patient had been previously admitted to the University Hospital back in 1934 when the following diagnoses were made: diabetes mellitus; diabetic acidosis; toxic neuritis of the sciatic nerve; hypertensive cardiovascular disease; and carotenemia. With an adequate diet supplemented by the administration of insulin the diabetic condition was controlled. She followed the diabetic regime for four years, after which she discontinued the diet as well as the insulin. Six months prior to her second admission to this hospital, her abdomen became markedly swollen, the legs edematous, and the face quite puffy. Because of the anasarca, she was prescribed salyrgan and theophylline. After several weeks of treatment, the edema disappeared, except from the legs and face. She remained relatively well for about two months, but then started to feel dyspneic and, finally, orphopneic. Digitalis was prescribed but had to be discontinued because of toxic manifestations. During the last few weeks previous to admission she suffered from severe attacks of cardiac asthma, and appears to have received intensive treatment with mercurial diuretics.

Her past history revealed that she was once quite ill with typhoid fever and pneumonia. The family and marital histories were totally noncontributory.

On physical examination, the patient was found to be markedly cachectic, acutely ill, propped up in bed and moaning as if in desperate pain. The blood pressure was 192 mm. of Hg. systolic and 60 diastolic. There was generalized yellowish discoloration of the skin. Marked tortuosity of the retinal vessels and old and fresh hemorrhagic areas were seen in both retinae. She presented a severe necrotizing stomatitis, glossitis, and gingivitis. The heart was enlarged to the left, with a regular rhythm and a to-and-fro murmur in the mitral area. There was marked peripheral arteriosclerosis, the liver was palpable 2 cm. below the right costal margin, and her legs were moderately edematous.

Laboratory findings were:
Hemoglobin—65 percent (9.4 grams) Hellige-Wintrobe)
Red blood cells—3.35 millions per cmm.
White blood cells—14,300 per cmm.
Neutrophiles—88 percent
Lymphocytes—12 percent
Urine:
Specific gravity—1.001
Sugar—Negative
Albumin—Faint traces
Sediment—4–6 R. B. C. per high-power field
P. S. P. elimination test (catheterized)—25 percent total elimination in two hours
Feces—Negative
Kahn Blood Test—000
Blood Chemistry:
Urea N.—19.7 mg. percent
N. P. N.—42.8 mg. percent
Uric acid—3.4 mg. percent
Glucose—81.2 mg. percent
Total proteins—6.63 grams percent
Serum albumin—4.31 grams percent
Serum globulin—2.32 grams percent
Cholesterol—136.6 mg. percent

Course in the Hospital. The patient's condition remained grave despite the measures instituted. On one occasion profuse bleeding took place from the necrotized tongue. The blood sugar level varied from 50 to 333 mg. percent. On August 3, 1940, the patient became comatose and died a few hours thereafter.

Post-mortem examination.[9] The body was that of a greatly emaci-

9. We are indebted to Dr. Enrique Koppisch, head of the Department of Pathology of the School of Tropical Medicine, for this autopsy report.

ated, elderly, white woman. Small, superficial, dirty-grey ulcers were visible on the floor of the mouth, beneath the tongue, toward the posterior molars on each side. Subcutaneous edema was not in evidence, and the serous cavities contained no excess fluid. The inferior margin of the liver extended 4 cm. below the costal border in the right midclavicular line. Both lungs were fixed in places to the parietal wall and diaphragm through old fibrous adhesions. Permission was not obtained for examining the cranial contents.

The heart weighed 250 gm. The subepicardial fat had undergone advanced serous atrophy, and the coronary arteries were prominent and tortuous. There were no valvular or endocardial alterations. The myocardium was pale pink and presented extensive fibrosis in the wall of the left ventricle, with reduction of the thickness of the latter to 0.4 cm. This was most marked toward the mitral valve ring, laterally, in the region irrigated by the circumflex branch of the left coronary artery. Irregular yellow areas were distributed throughout the fibrosed portions and were visible both on section and through the endocardium; the largest measured 0.5 cm. across. The coronary arteries were very rigid and diffusely calcified; their intimal aspect showed numerous bright yellow and gray plaques, and the lumen in some segments of all principal branches was distinctly narrowed.

The aorta was rigid due to advanced arteriosclerotic changes that extended from the ascending portion to the bifurcation. Calcification had taken place at many points, and some of the plaques had undergone superficial ulceration without thrombosis.

The lungs were not remarkable except for slight hypostatic congestion and slight edema. In the intima of the larger arterial branches were numerous, though small, atheromatous deposits.

The spleen weighed only 55 gm. On section the trabeculae stood out prominently, and the blood vessels in them had thickened walls and narrow lumina.

The liver was reduced in size to 920 gm. The surface was smooth, and the tissues had a yellowish tinge. The smallest visible arteries were thick-walled.

The left kidney weighed 125 gm. and the right, 110 gm. Both organs were similarly altered. The capsule could be removed without tearing the renal surface. The surface was pale yellow in portions and rather bright red in others; it was everywhere finely granular, the granules being pale and averaging a fraction of a millimeter in diameter. On section the cortex was narrowed to 0.4 cm. in some

places, and was pale pink, with blurred striations and invisible glomeruli; it was poorly outlined against the medulla. The medullary pyramids were very pale and but faintly striated. The renal arteries and their main branches showed rigidity, marked thickening of the wall, with plaque formation along the intima, and atheromatous degeneration and calcification of plaques. Some of these arteries were eccentrically narrowed. The interlobar and arcuate arteries had thick walls and very narrow lumina. The peripelvic fat was scanty and atrophic.

The mucosa of the urinary bladder was intensely congested in the lower portions, toward the trigone. There was no trabeculation and no hypertrophy of the wall.

The uterus was altered only in that the cervix was enlarged. The external os was represented by a transverse slit. The ovaries were atrophied.

The tongue was whitish in its distal two-thirds, and very smooth toward the tip. At the base the vallate papillae were poorly outlined, and on the left lateral aspect there was a very shallow ulcer measuring 1.5 by 0.8 cm. The base of the ulcer was smooth and light brown.

The mucosa of the cecum was moderately reddened, while the terminal 10 cm. of the rectum was very intensely congested. Throughout the latter portion, particularly near the anus, there were shallow ulcers with their floor covered by a layer of greenish exudate.

The thyroid gland was faintly nodular in places, but of normal size. On section it showed a slight increase of the stroma and rather numerous acini that had undergone dilatation to 0.3 cm. These acini formed groups surrounded by a thin fibrous capsule, and each such nodule measured not over 0.5 cm. in diameter. The pancreas, gall bladder, suprarenal glands, parathyroids, oviducts, esophagus, stomach, small intestine, larynx, trachea, and lymph nodes were normal.

Microscopic description. Kidneys: Figure 1 is representative of most of the renal alterations. The larger arteries showed hypertrophy of the media, reduplication of the internal elastic lamella, and proliferation of connective tissue in the subintima. The smaller arteries and the arterioles throughout the sections were the seat of advanced fibrotic and hyaline alterations that had led to thickening of the wall and often to almost complete obliteration of the lumen. A fairly diffuse thickening of the intertubular stroma was in evidence, more marked in patchy areas where there were atrophied tubules

and glomeruli in various stages of fibrosis and hyalinization. A scanty lymphocytic infiltration had taken place in some of the areas of scarring. In the cortex there were groups of moderately dilated tubules alternating with atrophied ones. The dilated tubules were usually lined by cuboidal epithelium which at times was finely vacuolated. Coagulated protein and hyaline casts were frequently encountered in the lumen of tubules. More than one half of the glomeruli were in an advanced stage of atrophy and replacement by hyalinized fibrous tissue. The better preserved glomeruli were empty of blood at times, and at other times, quite congested. Capsular adhesions were but rarely observed, and only in markedly fibrosed glomeruli or in a few with ischemic necrosis. No increase of polymorphonuclears was observable in the glomeruli. Suitable stains demonstrated the presence of abundant fat in the tubules, especially in the collecting ones.

An additional interesting feature was encountered in the better preserved glomeruli (Figures 1, 2, and 3). This consisted in the formation of hyaline masses that had developed between the glomerular lobules or else would extend more or less continuously toward the point of entry of the afferent vessel. In a few instances the intraglomerular hyaline strands were continuous with the hyaline in the afferent arteriole. The intercapillary hyalinization was present in many of the glomeruli, but not in all, and the earlier stages of the process, though not detectable in sections stained with hematoxylin and eosin, were well brought out by the basement membrane stain. The hyaline masses and strands did not give the amyloid reaction with stains for that substance. The endothelial and epithelial cells were not increased, but at times the former seemed compressed closer together than usually. There were no necrotic alterations in the afferent arterioles. The space of Bowman's capsule was large in most glomeruli, and contained coagulated protein. With the elastica and Van Gieson stain the intercapillary hyaline masses stained red, and the reduplication of the internal elastic lamella of the larger arteries was clearly brought out. Kimmelstiel's basement membrane stain showed these structures to be delicate and not split, in the glomerular capillaries. (Figures 2 and 3.) The hyaline masses stained blue and were situated between the capillaries. In the atrophied tubules the basement membrane was thickened, at times split and much folded on itself, these alterations being proportional to the degree of tubular atrophy. In Bowman's capsule the alterations of the basement membrane were very similar to those seen in the tubules.

Heart. The wall of the left ventricle presented extensive areas of old fibrosis with widespread replacement of myocardial fibers. In parts of the scars, small clumps of hemosiderin pigment were still present. In other areas the scars were in the form of thin or thick bands. The muscle fibers away from the scars were hypertrophied. In some sections there were minute foci of pallor vacuolation and even necrosis of the muscle fibers, accompanied by beginning thickening of the stroma. A little hemorrhage had taken place into some of these foci. In one section there was a large area of necrosis of the myocardium; hemorrhage had occurred toward the endocardium, and the hemorrhagic portion was quite densely infiltrated with polymorphonuclears. A small thrombotic mass covered the endocardium at this point.

Lungs. They presented a little edema, and rare alveoli filled with polymorphonuclears.

Pancreas. Small patchy areas of fibrosis were in evidence in the organ (Figure 4). Some of the larger pancreatic ducts showed hyperplasia of the epithelial lining. The islets seemed normal, but no special stains were applied.

Tongue and rectum. The surface epithelium of the tongue was atrophied. The lingual and rectal ulcers exhibited no unusual characters.

Thyroid. The nodules encountered in the thyroid gland were adenomatous in character. The acini in them were overdistended with colloid, and presented epithelial spurs.

Blood vessels. The aorta and larger arteries of the heart, kidneys, and other organs showed thickening of the intima by fibrosis, with formation of large plaques in which atheromatous degenerative changes and calcification were often prominent features. The smaller arteries in the pleura, pulmonary parenchyma, spleen, liver, and uterus exhibited hypertrophy of the wall and hyaline changes in fairly generalized fashion. The arterioles of the spleen, pancreas, periadrenal fatty tissue, liver, uterus, small intestine, appendix, and colon were hyalinized, with thickened walls and narrow lumina.

Anatomical diagnosis. Diffuse arterial and arteriolar sclerosis; intercapillary glomerulosclerosis; arteriolar nephrosclerosis, advanced; infarcts of myocardium, old and recent; thrombosis of heart, left ventricle, early; ulcerative stomatitis and colitis due to

mercury; fibrosis of pancreas, early; adenomas of thyroid gland; bronchopneumonia, and fibrous pleural adhesions.

SUMMARY

We are reporting six cases of intercapillary glomerulosclerosis, one of them with confirmatory autopsy findings. All were native Puerto Ricans, four being females and two males. All six patients were fifty-two years old or over. All the cases presented a picture of mild diabetes requiring little or no insulin for adequate control. All patients had a hypertension varying from 140 to 250 mm. of Hg systolic and from 60 to 140 diastolic. In one instance (Case 5) the hypertension was so marked that the diagnosis of malignant hypertension was suggested. In one case (Case 2) peripheral involvement of the facial nerve was encountered. In five cases retinal changes were noted, and were so pronounced in three of them as to suggest hypertensive retinopathy. Edema of the discs and partial atrophy of the optic nerve was seen in one case. Cardiac failure, with a certain degree of myocardial decompensation, and a nephrotic picture, were present in all. A mild state of azotemia was observed in only one instance. There were two fatal cases: In Case 5 the diabetes was first discovered in 1936, death taking place four years thereafter, while Case 6 succumbed six years after diagnosis of the diabetes. It is not possible to determine from an analysis of these cases which of the two conditions—diabetes mellitus or hypertension—anteceded the other.

FIGURE 1

KIDNEY: GENERAL VIEW OF RENAL ALTERATIONS; THE INTERCAPILLARY SCLEROSIS IS WELL SHOWN IN ONLY ONE GLOMERULUS. HEMATOXYLIN AND EOSIN. 80X

GRABADO 1

RIÑÓN: ASPECTO GENERAL DE ALTERACIONES RENALES; LA ARTERIOESCLEROSIS INTERCAPILAR APARECÍA CLARAMENTE EN UN SOLO GLOMÉRULO (TEÑIDO CON HEMATOXILINA Y EOSINA). X 80

FIGURE 2

GLOMERULUS WITH INTERCAPILLARY HYALINIZATION; BASEMENT MEMBRANE DELICATE AND NOT SPLIT. KIMMESLTIEL'S BASEMENT MEMBRANE STAIN. 360X

GRABADO 2

GLOMÉRULO CON HIALINIZACIÓN INTERCAPILAR; MEMBRANA BASAL FINA Y SIN HENDIDURA. (TINTE DE KIMMELSTIEL PARA LA MEMBRANA BASAL.) X 360

FIG. 1

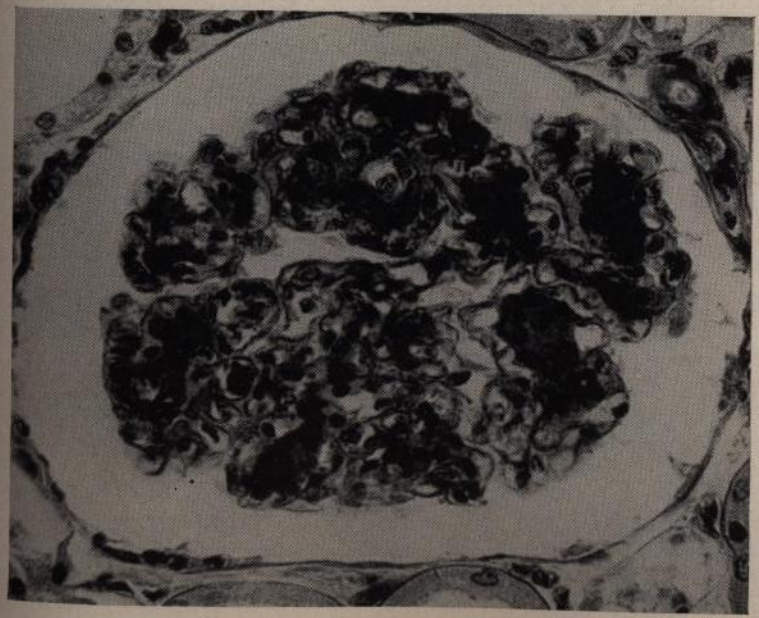

FIG. 2

FIGURE 3
INTERCAPILLARY GLOMERULOSCLEROSIS. KIMMELSTIEL'S BASEMENT MEMBRANE STAIN. 900X

GRABADO 3
GLOMERULOESCLEROSIS INTERCAPILAR. (TINTE DE KIMMELSTIEL.) X 900

FIGURE 4
FIBROSIS OF PANCREAS. HEMATOXYLIN AND EOSIN. 80X

GRABADO 4
FIBROSIS PANCREÁTICA. (HEMATOXILINA Y EOSINA.) X 80

FIG. 3

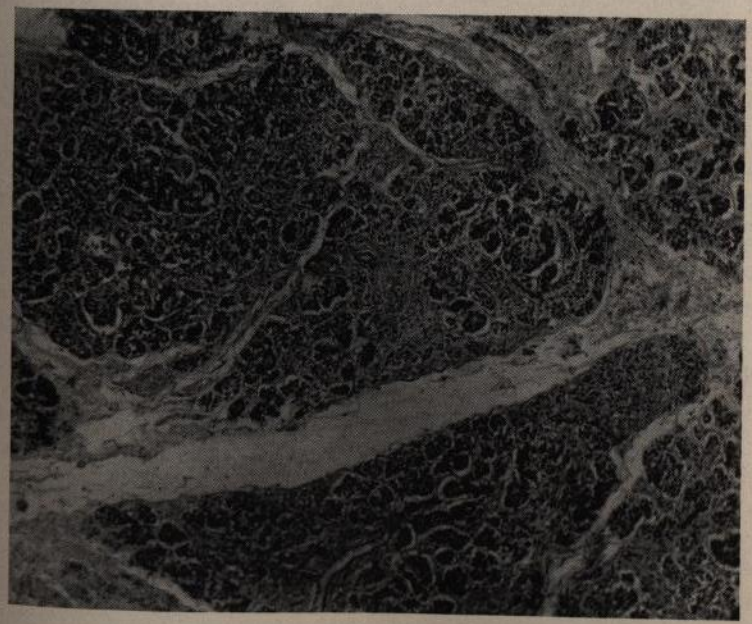

FIG 4