Structural-Functional Relationships in Diabetic Nephropathy

S. Michael Mauer, Michael W. Steffes, Eileen N. Ellis,

Surgery, and Medicine, University of Minnesota School of

meruli and that these open glomeruli did not manifest marked surface of the renal core and to ensure correct division of the core.

"deposition of basement membrane material." Bader et al performed under the dissecting microscope, to provide glomeruli for

Figure 1. (*A*) Representative glomerulus from a biopsy with a mean IME of 1.25 (PAS × 350). (*B*) Representative cortical area with a mean index of interstitial fibrosis of 0.25 (arrow) in same biopsy as *A* (PAS × 350). (*C*) Representative glomerulus from a biopsy with a mean IME of 3.5 (PAS × 350). (*D*) Representative cortical area with a mean index of interstitial fibrosis of 2.75 (arrow) in same biopsy as *C* (PAS × 350).

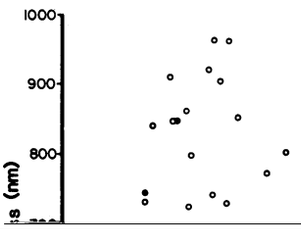
a subtle finding easily overlooked unless specific examination for this parameter is carried out (Fig. 1, *B* and *D*).

The index of arteriolar hyalinosis was determined as a semiquan-

measured for each patient because many did not have adequate numbers of glomeruli in the biopsy specimens, estimates of absolute volumes of glomerular components and areas of glomerular surfaces

Figure 2. Electron photomicrograph with superimposed grid illustrating lines (solid)

tions with surfaces used to estimate surfaces. Points for determining fractional vol-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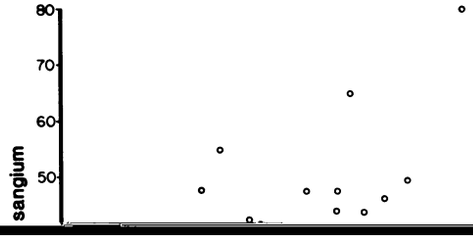
80
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clear that there can be overlap in the magnitude of the

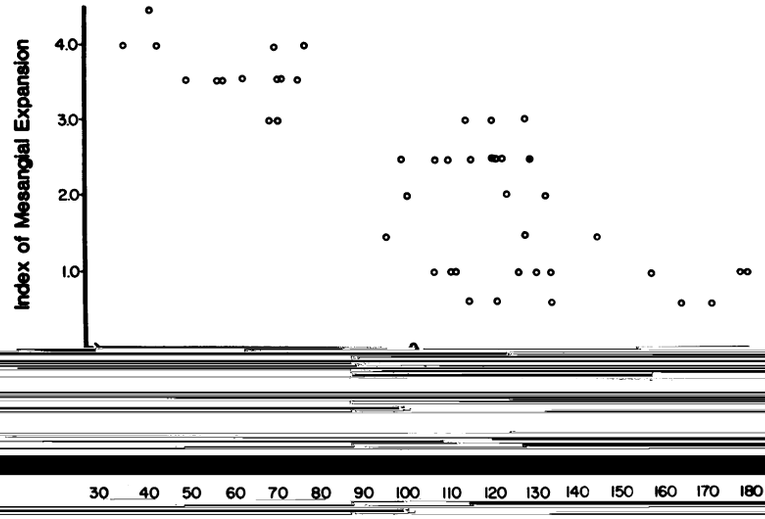


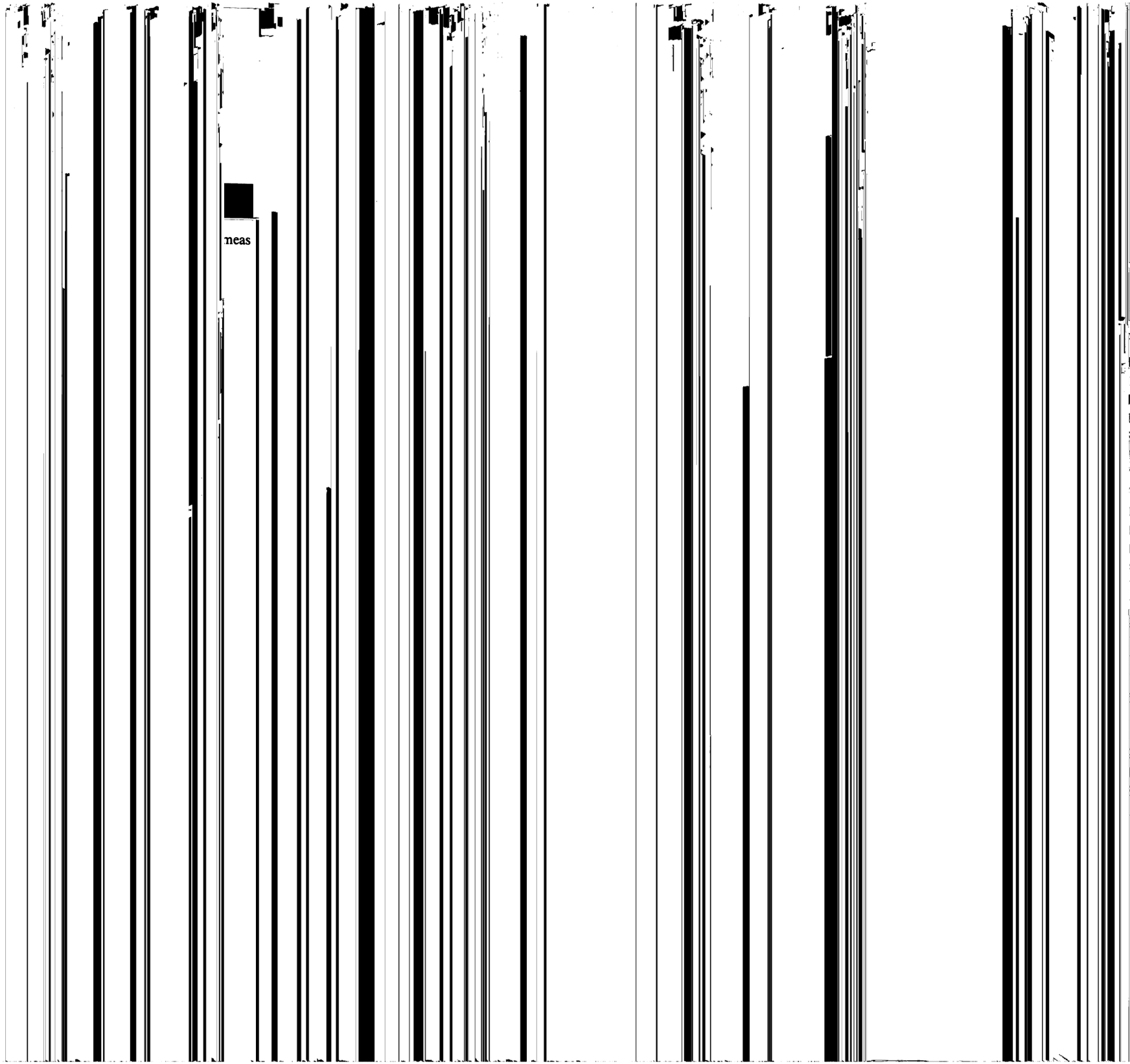
Figure 10. Relationship of index of mesangial expansion (mean of scores for individual glomeruli in biopsy) and creatinine clearance. $r = -0.72$, $P < 0.0005$.

volume in patients with marked mesangial expansion (>37%).

As expected from the method of patient allocation into groups, absolute mesangial volume increased markedly as fractional

Discussion

Most of the patients studied here had renal biopsies performed



AE

g/24 h

ID‖
13.6
IM¶
87.0
92.3
M
M
M
12.5
14.2
19.2
46.8
M
M
92.3
M
M
M
50
M
M
20
12.7
34

Table II. Relationship of Blood Pressure

and mesangial matrix constituents. Furthermore, unilateral

and Total Mesangial Volume

Table IV. Glomerular Morphometric Parameters Expressed as Absolute Values in Diabetic Patients and Normal Subjects

	Normal subjects	Diabetic patients with total mesangium ≤26%	Diabetic patients with total mesangium 27–37%	Diabetic patients with total mesangium >37%
Number of subjects	26	19	12	14
Glomerular volume ($\mu m^3 \times 10^6$)	1.3	1.4	2.4	2.4
Total mesangial volume/glomerulus (μm^3)	0.19	0.26	0.7	1.2
Peripheral capillary filtering surface/ glomerulus (μm^2)	0.17	0.16	0.23	0.12
Endothelial surface mesangial-interface/glomerulus (μm^2)	0.06	0.08	0.16	0.17

values derived from estimates of glomerular volume must be considered to be preliminary since a discrete glomerular volume

Although glomerular sclerosis cannot, by itself, explain

decreased GFR in diabetic patients with mild to moderate

physical forces result which, independent of the diabetic state, produce progressive glomerular injury. Glomerular sclerosis would aggravate this situation but would not be a necessary

Acknowledgments

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Evaluation and Treatment of High Blood Pressure. U. S. Department of Health and Human Services. National Institutes of Health Publication No. 81-1088.

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