in the etiology of edema in this disease. Moreover, it has been reported that prolactin restores the aldosterone³⁾ and ADH⁴⁾ action in the escape state, and renal kallikrein-kinin system may be related to the escape phenomenon⁵⁾. Therefore, higher plasma ADH levels and aldosterone concentration in the upright position may contribute to the development of edema via hyperprolactinemia and suppression of the renal kallikrein-kinin system.

On the basis of the present study, it could be assumed that the increased vascular permeability and the endocrinological poly factors were related in a cooperative fashion to the etiology of the idiopathic edema.

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II. Clinics of Edema (6) Treatment—Diuretics, Refractory Edema

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Among diuretics, loop diuretics (LD) has been widely used for patients with refractory edema. Short time test with furosemide (FM) has been applied to edematous patients, mainly renal and cardiac, and urine output and urinary solute excretion were measured.

1. Diuretic response to FM and GFR;

Following FM administration into eight young healthy men who have been in dry state overnight, negative free water clearance ($T_{H_2O}^c$) decreased both under water-load and water deprivation. Same examinations were carried out to edematous

patients with lower renal function. In three patients with chronic nephritis, whose Ccr was average 35.6 ml/min, $T_{H_2O}^c$ was unchanged under water-load but decreased slightly under water deprivation. In four nephritic patients with further lower renal function of mean Ccr 10 ml/min, $T_{H_2O}^c$ was not altered either under water-load or water deprivation. Therefore, it is concluded that, although urine output increases temporarily following LD administration, absence of response in free water clearance to the diuretics tends to indicate refractory-edema.

2. Other measures to treat refractory edema;

In addition to LD, other drugs are used with diuretics: antihypertensive to hypertensive diseases, peripheral vasodilators to cardiac diseases, plasma volume expander to nephrotics and antialdosterone to cirrhosis. To patients with severe refractory edema and no absolute response to drug therapy, peritoneal and hemodialysis, parti-

cularly with no dialysate flow (dialysate free ultrafiltration) are recommended. Ascites to jugular vein perfusion technic is also applied to refractory cirrhotic patients with severe ascites. However, these mechanical procedures produce only temporary improvement and overall outcome is dependent on recovery of original diseases.